DOCUMENT RESUME

ED 106 575 CE 003 747

TITLE	Exploring Careers in Environmental Protection.
INSTITUTION	Cincinnati Public Schools, Ohio.
PUB DATE	73
NOTE	90p.; For related documents see CE 003 746, CE 003 748-64 and CE 004 312; Revised Edition
EDRS PRICE	MF-$0.76 HC-$4.43 PLUS POSTAGE
DESCRIPTORS	Air Pollution Control; *Career Education; Career Planning; *Conservation (Environment); *Curriculum Guides; Ecology; *Environmental Education; Environmental Technicians; Grade 9; Grade 10; High School Curriculum; Learning Activities; *Occupational Information; Pollution; Secondary Education; Teaching Methods; Vocational Development; Waste Disposal; Water Pollution Control
IDENTIFIERS	*Career Exploration

ABSTRACT

The career exploration program for grades 9 through 10, as part of a comprehensive K-10 career development program, attempts to develop an awareness of and appreciation for work, extend knowledge of the variety of career opportunities, and provide experiences in career areas of individual interest. The document, a collection of materials consisting of student learning experience packets, a resource list, and teaching strategies, is designed to introduce the students to occupations in environmental protection. The course is designed for students to: gather information regarding jobs; evaluate careers; develop standards of behavior for effective job performance; locate places of employment; participate in laboratory experiences; and to investigate job requirements. The activity packets explore careers in: (1) noise pollution control, (2) water pollution control, (3) solid waste disposal, (4) air pollution control, (5) food contamination control, (6) radiation and decontamination control, and (7) park and recreational land management. The learning activities involve individualized lessons, role-playing, field trips, simulation, group work, reports, community coordination of resource persons and students, evaluation, self-analysis tests, and discussions. The appendix contains suggested procedures for field trips, exploration trips, sample forms for permission and reports, games and simulations, a group work exercise, and a list of related films. (JB)

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

CAREER EXPLORATION 9 – 10

EXPLORING CAREERS

IN

ENVIRONMENTAL PROTECTION
(Tentative Copy)

Revised Edition
1973

CAREER DEVELOPMENT K – 10

CINCINNATI PUBLIC SCHOOLS

2

CE003797

ED106575

CAREER EXPLORATION

CINCINNATI PUBLIC SCHOOLS

GRADES 9-10

EXPLORING CAREERS

IN

ENVIRONMENTAL PROTECTION

(Tentative Copy)

Revised Edition
1973

[illegible] 3

CAREER DEVELOPMENT

The Career Development Program responds to the needs of students, taxpayers, and employers for the public schools to provide personal, social, and economic relevance in the educational process. It is an integral part of the educational process essential to the development of all students.

The Career Development components, which are Career Motivation (K-6), Career Orientation (7-8) and Career Exploration (9-10), develop an awareness and appreciation for work, extend knowledge of the variety of career opportunities, and provide experiences in career areas of individual interest. These goals are accomplished through a curriculum based on pupil activities involving simulation, role playing, and individual investigation. These activities require that administrators and teachers develop a new level of working relationships with community resources such as public institutions, business, labor, and industry.

Every individual's right to learn what he or she needs in order to be a producing, participating member of society is a fundamental responsibility of education. Each individual also has a right to self-fulfillment. Career Development, presented as inseparable elements inherent within every level and subject area of the school curriculum, provides each student with the skills and insights to recognize and pursue goals of personal significance. As a result of this program students will increase their abilities to make well-informed and experience-based decisions related to their personal life, school program, and career selection.

Donald R. Waldrip, Superintendent
Cincinnati Public Schools

CAREER EXPLORATION

Career Exploration is the 9th and 10th grade component of the Career Development Program. Its primary goal is to provide experiences related to career areas chosen by the student. Focus is on the student's perception of himself or herself in relation to the real world of career opportunities. Emphasis is on individualized and personalized activities and experiences.

The student chooses and studies a specific career area using skills and insights gained in earlier parts of the Career Development Program. Students explore occupations within the chosen area with particular attention to those most closely related to their own needs, interests, and abilities. They will experience some of the satisfactions, opportunities, limitations and frustrations peculiar to the various occupations.

Career Exploration is planned as the culmination of the Career Development Program. Successful exploratory experiences will enable the student to formulate and refine realistic and personally meaningful career goals. These experiences will also provide a basis for planning a course of studies in the 11th and 12th grades (and beyond) pursuing career goals.

Stanley A. Marsh
Administrative Assistant to
the Superintendent

FOREWARD

This manual is one of a series produced by the Cincinnati Public Schools as a part of the project designed to provide Career Exploration for students in grades 9 and 10.

It is designed to provide activities and information about an Occupational Area that will provide a more in-depth study than that presented in Career Orientation in grade 7 and 8.

This is a tentative guide and has been developed for the purpose of field testing and revising based upon feedback for participating teachers.

This manual was developed by Merle Koenig, a teacher of Science at Aiken High School. Peter Fritsch, a teacher of Science at Campbell Junior High School revised the manual in the summer of 1973. Jack Ford, an instructional consultant, conducted the curriculum development under the general supervision of Mr. Ralph E. Shauck, Coordinator of Instructional Services.

TABLE OF CONTENTS

	ENDORSEMENT	i
	RATIONALE	ii
	FOREWARD	iii
I.	INTRODUCTION	
	A. Definition of Career Area	2
	B. Course Objectives	2
	C. Course Strategy	2
	1. Introductory Activities	2
	2. Procedures	3
	3. Evaluation	3
	4. Exploration Trips	3
	D. Suggested Time Table	4
II.	CAREER EXPLORATION ACTIVITIES	6
III.	APPENDIX	65

INTRODUCTION

A. DEFINITION OF CAREER AREA

The Career Area of Environmental Protection includes occupations such as: noise pollution controllers, water pollution controllers, solid waste disposers, food contamination controllers, radiation decontamination controllers, and recreation land management.

B. COURSE OBJECTIVES:

1. Students will select the Career exploration activities they wish to explore based on their individual interests.

2. Students will be able to gather information regarding the jobs available as set out in the exploration activities.

3. Students will participate in laboratory experiences utilized in various jobs.

4. Students will locate specific places of employment.

5. Students will investigate the job requirements, salaries, hazards, etc. related to the exploration activity.

6. Students will evaluate specific jobs in terms of the appeal of the job to themselves.

7. Students will be assisted in developing acceptable standards of behavior such as desirable personality, emotional control, dependability, responsibility, and loyalty.

C. COURSE STRATEGY

1. Introduction Activities
   a. The jobs in the field of environmental protection to be explored by the students are organized into exploration activities. Students will complete as many of these packets as time permits. It is up to the class and the teacher to decide how to use these activities. Some suggestions are: in teams, individually, or as an entire class. It is suggested that at the outset of the course, students be asked to check with their parents, neighbors, friends, etc., as to the possibility of one of these coming into the classroom as a resource person.
   b. Each student should take at least one exploration trip during the course. Other first hand experiences should come from after school visitations and classroom resource persons.
   c. The activity packets are intended for student exploration in careers in: 1) noise pollution control, 2) water pollution control, 3) solid waste disposal, 4) air pollution control, 5) food contamination control, 6) radiation decontamination, and 7) park and recreational land management.

d. It is most important to remember that resource persons must be contacted several weeks in advance of the appearance--4 weeks notice should be the minimum. Requests should be made in writing. Even if the students are going to make the contacts, the teacher should write the persons to be visited. The success of the course depends upon the use of resource persons. The students must talk to people in the field to get the feel of the job--a book will not serve this purpose.

2. Procedures

Students will explore the careers specified in the paragraph under Definitions of Career Area. The teacher should alert the students to the fact that some of the positions require more skills and more responsibility than others.

a. Exploration Activities. Students proceed at individual speed and according to individual interests and abilities. Students research and record with teacher guidance when needed.

b. Each student could specify an interest in one or two of the jobs and then be assigned to a group of students with like interests. The groups complete the job exploration then share their findings with the rest of the class. Students could function as members of more than one group.

c. Teacher instruction in the area.

d. A combination of the above for variety in the exploration and in classroom procedures.

e. After jobs have been explored and responsibility for each task on the introductory list specified and classified, students (via interviews and job applications) will apply for and be assigned jobs.

f. A special experience being planned for students in every career exploration course is a small group "Exploration Trip". Effort has been made to make this as simple as possible for the classroom teacher. As noted in Appendix B, these trips may take place before the first class meeting if the exploration course is scheduled for the 2nd, 3rd or 4th quarter.

3. Evaluation

Let each student write a self-evaluation sheet indicating which exploration activities worked out well.

The last exploration activity in this course will ask each student to participate in a "Self Evaluation of Career Maturity" and will provide each student an opportunity to analyze and discuss their career-related experiences.

D. SUGGESTED TIME TABLE

#	Exploration Activities Title	Days
1	Introduction to Course	2
2	Use of D.O.T.	1
3	Environmental Protection Careers	3
4	Noise Pollution Control	4
5	Water Pollution Control	8
6	Solid Waste Disposal	5
7	Air Pollution Control	6
8	Food Contamination Control	4
9	Radiation and Decontamination Control	2
10	Park and Recreation Land Management	4
11	Related Careers	4
12	Self Evaluation of Career Maturity	2
		45

II. CAREER EXPLORATION ACTIVITIES

INTRODUCTION TO COURSE

EXPLORATION ACTIVITY (INTRODUCTORY) (2 day)

OBJECTIVES	ACTIVITIES	RESOURCES
Students will be able to: 1. Discuss critically the objectives of the course. 2. Question people's attitude at work under various conditions as illustrated in a film. 3. Form a general understanding of the course outline and procedure. 4. Form some basic conclusions through the "self-analysis quiz." 5. List and discuss at least 4 important factors of good on-the-job performance. 6. Describe a wide variety of skills needed for specific jobs in this occupational area.	1. The student will be informed of the purpose of this course, what is hoped to be accomplished, and will be led into a discussion of activities involved in Career Exploration. 2. The student will defend or reject by role playing, the position of maintaining good personal appearance, attitude and conduct on the job. 3. Explain to students the relation of the course and the "Self-Analysis Quiz" to their career selection. Students will participate in this self-analysis quiz. 4. Hand out and discuss a "Job-Performance Rating Sheet" which will be administered and discussed as part of the last exploration activity in this course.	Class set of "Self-Analysis Quiz" (attached) Class set of "Job Performance Rating Sheet" (attached) "What Do We Look Like To Others" 16 mm film, 10 min., Sandler Instructional Films, Inc. Board of Education.

SELF-ANALYSIS QUIZ

Directions: Check the line closest to the statement that identifies you. If you are uncertain, check the middle space.

Make at least average grades	_____ _____ _____	Make below average grades
Learn quickly	_____ _____ _____	Learn slowly
Enjoy reading books, magazines, etc.	_____ _____ _____	Enjoy reading comics
Like school and do extra work	_____ _____ _____	Do only schoolwork that is necessary
Talk and write well	_____ _____ _____	Talk and write poorly
Good planner and organizer	_____ _____ _____	Poor planner and organizer
Like children	_____ _____ _____	Dislike children
Patient with children's questions	_____ _____ _____	Impatient with children's questions
Outgoing	_____ _____ _____	Withdrawn
Popular	_____ _____ _____	Not popular
Have large group of friends	_____ _____ _____	A few close friends
Have confidence	_____ _____ _____	Unsure around others
Give advice	_____ _____ _____	Not asked for advice
Outspoken	_____ _____ _____	Quiet
Sensitive to others	_____ _____ _____	Insensitive to others
Trust people	_____ _____ _____	Do not trust people
Volunteer	_____ _____ _____	Do not volunteer
Pleasant personality	_____ _____ _____	Do not have pleasant personality
Have a sense of humor	_____ _____ _____	"Touchy"
Not prejudiced	_____ _____ _____	Prejudiced

JOB PERFORMANCE RATING SHEET

NAME: _____ DATE: _____

DEPT. _____ OPERATION: _____

	EXCELLENT	GOOD	FAIR	POOR
Attendance & Punctuality				
Quality of work				
Production				
Initiative				
Cooperation with instructor				
Cooperation with other students				
Interest in job				
Meets industrial quality standards				

If the student rates "poor" on any factor

or

If the student rates "fair" on more than three factors:

Discuss with the student the areas in which he or she will need to improve, before he can attain success in his chosen field.

Remarks: _____

_____

_____

EXPLORATION ACTIVITY (INTRODUCTORY)

Use of the D.O.T. (Dictionary of Occupational Titles) Number:

The D.O.T. lists 35,550 jobs with a code number for each. The last three digits of this code refer to the relationship of that job to data, people and things. This exploration activity provides the students some experience in using this information to identify jobs which match their interests.

OBJECTIVES	ACTIVITIES	RESOURCES
The student will be able to: Compare their knowledge about the data, people, things content of jobs to factual information listed in the D.O.T. for five jobs of personal interest.	The teacher will conduct a classroom discussion on the D.O.T. code number in identifying the data, people, things orientation of jobs. (See the attached page for examples.) Following this discussion each student is to complete the "D.O.T. Worksheet" which compares the student's estimate of the data, people, things job content to that listed in the D.O.T.	Dictionary of Occupational Titles, Volumes I and II Make a class set of "Examples of D.O.T. Code Usage." Make a class set of the "D.O.T. Worksheet"

D.O.T. WORKSHEET

STEP 1. In table I at the bottom of this page, write the names of five jobs which are interesting to you.

STEP 2. Use the handout sheet titled "Examples of D.O.T. Code Usage" and make an estimate of the correct code to describe this job. Record this estimate in Table I.

STEP 3. Use Volume I or II of the D.O.T. and look up the D.O.T. code designation for each job. Compare these designations to your estimate.

TABLE I

	NAME OF JOB	STUDENT'S ESTIMATE OF THE CORRECT CODE	D.O.T. CODE DESIGNATION
1.	_____	XXX._ _ _	_____
2.	_____	XXX._ _ _	_____
3.	_____	XXX._ _ _	_____
4.	_____	XXX._ _ _	_____
5.	_____	XXX._ _ _	_____

EXAMPLES OF D.O.T. CODE USAGE

JOB TITLE	D.O.T. CODE	D.O.T. CODE MEANING
High School Teacher	091.228	
		(Things) 8 - No significant relationship
		(People) 2 - Instructing
		(Data) 2 - Coordinating
Waitress	311.878	
		(Things) 8 - No significant relationship
		(People) 7 - Serving
		(Data) 8 - No significant relationship
Stock Clerk	223.387	
		(Things) 7 - Handling Things
		(People) 8 - No significant relationship
		(Data) 3 - Compiling
Auto Mechanic	620.281	
		(Things) 1 - Precision working
		(People) 8 - No significant relationship
		(Data) 2 - Analyzing data

DATA (4th digit)

0 Synthesizing
1 Coordinating
2 Analyzing
3 Compiling
4 Computing
5 Copying
6 Comparing
7
8 No significant relationship

PEOPLE (5th digit)

0 Mentoring (Counseling)
1 Negotiating
2 Instructing
3 Supervising
4 Diverting
5 Persuading
6 Speaking-Signaling
7 Serving
8 No significant relationship

THINGS (6th digit)

0 Setting-Up
1 Precision Working
2 Operating-Controlling
3 Driving-Operating
4 Manipulating
5 Tending
6 Feeding-Offbearing
7 Handling
8 No significant relationship

For a definition of the above see pages 649 and 650 in Appendix A of the Dictionary of Occupational Titles Volume II.

Exploration Activity #3

ENVIRONMENTAL PROTECTION CAREERS

OBJECTIVES	ACTIVITIES	RESOURCES
1. List 10 jobs related to environmental protection. 2. Define and/or differentiate the terms Ecology, Conservation, Environmental Protection, Consumer protection.	The students should be led into a discussion of what is meant by the term "Environmental Protection" and generate in the course of this discussion a list of jobs related to Environmental Protection. Students should identify areas within Environmental Protection which are of particular individual interest and send a letter to organizations in preparation for individual contact by the student. A current film on Environmental Protection can be used as a basis for classroom discussion.	Career Opportunities in Ecology, Conservation, and Environmental Protection, J.G. Ferguson Publishing Co., Chicago, Illinoi $6.95. Model Letter (Attached) Donna L. T. Seuhy State of Ohio Department of Nat. Resources 1430 Belcher Drive Columbus, OH 43224 Contact the Environmental Protection Agency, 4676 Columbia Parkway 684-8201 for appropriate film and/or resource person.

19

MODEL LETTER for use by teacher preceding a student visit

USE LETTERHEAD PAPER

Dear Sir: (name preferred, if known)

In the next few days a student from _____ _____ High School will be contacting you for information regarding career opportunities and requirements in your field of work.

This student is taking a course entitled "Career Exploration in Environmental Protection" as part of the State of Ohio Department of Education requirement that students be exposed to career exploration at the ninth and tenth grade levels.

The intent of the student's visit is to gain information to share with the class as to job analysis and availability. It is not intended as a personal job interview nor application. Your cooperation with this student is greatly appreciated.

Sincerely,

EXPLORATION ACTIVITY #4

NOISE POLLUTION CONTROL

OBJECTIVES	ACTIVITIES	RESOURCES
Students will be able to: 1. Identify the sources of noise pollution. 2. Identify the effects that noise has made upon man. 3. Analyze the career of an audiometer technician. 4. Analyze the need for noise pollution controllers. 5. Predict careers that will be in existence in the area of noise pollution control in the next 10 years and analyze the careers. 6. Write a letter to a public official concerning the need for noise pollution control. 7. Evaluate the need for careers in the field of noise pollution control.	1. a. Walk to a main traffic artery and listen for sounds heard while on walk or visit school shops. b. List the sources of sounds and compare intensity and pitch. 2. a. Play a tape and stand in close proximity to other students while listening (see resources) b. Verbalize reactions to tape. c. Analyze problems created by noise pollution. d. Relate conflicts of crowding life situations (ex. ball games, restrooms, study halls, school buses, etc.) 3. a. Observe use of decibel meter. b. Distinguish among duration, loudness and frequency. 4. a. Telephone city solicitor's office to get information on city noise control ordinances. b. Identify the job of the person who wrote the ordinances. c. Discuss the law enforcement agencies who enforce the city ordinances. d. Discuss the source of information as to violations of city ordinances. 5. a. List the requirements of a career as a noise analyzer. b. Suggest the areas of medicine that would specialize in noise pollution control. c. Interview an acoustical consultant or acoustical contractor to obtain a job analysis. d. Design on paper a study area for 30 students within the space of your classroom allowing for minimum of noise pollution. 6. a. Identify city officials b. Select one to which to write a letter c. Write the letter, proofread, and rewrite d. Mail the letter. e. Analyze the answer.	1. a. Film: "To Conserve and Protect", see MTPS list 14½ min. b. Booklet "Noise Pollution" by Lavaroni & O'Donnell Addison-Wesley. 2. Tape recorder and prerecorded tape which includes quiet interlude, pleasant music, with increasing amounts of noise, ending with high noise intensity. 3. a. City officials names and departments should be known to teacher. b. Envelopes, paper and postage stamps needed. 4. Cincinnati Safety Department decibel meter. 5. Assistant Health Commissioner, Dr. Mitchell Zavon 352-3158.

E. The following is taken from Ordinance No. 406-1958 of the City of Cincinnati, Section 511-2:

> "Loud Noise in the Operation of Vehicles. It shall be unlawful for any person to operate a motor vehicle upon any street or highway so as to create loud or excessive noise. Any person operating a vehicle on a street or highway which emits or creates sound or noise in excess of 95 decibels as measured on the A Scale of a General Radio Company No. 1551-A sound level meter, or equivalent, stationed at a distance of now less than twenty (20) feet to the right of the vehicle as said vehicle passes the sound level meter, shall, prima facie, be guilty of producing loud or excessive noise. Nothing herein shall be construed to prohibit the blowing of horns when necessary to prevent an accident or the use of sirens or other similar devices on authorized emergency vehicles.
>
> Any person violating the provisions of this section shall, upon conviction thereof, be punished by a fine of not to exceed twenty-five dollars ($25.00) for the first offense and for the second and subsequent conviction within one year thereafter by a fine of not to exceed one hundred dollars ($100.00).

WATER POLLUTION CONTROL

EXPLORATION ACTIVITY #5

OBJECTIVES	ACTIVITIES	RESOURCES
Students will be able to: 1. Identify three careers that are involved with water pollution control. 2. Compare government and private sector job availabilities. 3. Rank jobs according to levels of formal education required. 4. Analyze the jobs. 5. Assemble data which answers the following questions: a. Is there a need for increased jobs in the area of water pollution control? b. Are the number of jobs available related to legislation? c. Is additional city, county or state legislation needed? d. What is the need for clean water and how is it obtained?	1. a. Use phone book (yellow pages) b. Visit City Hall (individuals during or after school). c. Telephone Environmental Protection Agency EPA d. Search the want ads. e. Investigate water uses, sources, disposal and sources of contamination. 1. Trace the water cycle 2. Locate the city pumping station and discuss city water supply. 3. Use a "comic book" and read about water treatment plants. 4. Trace sewage of city from toilet to river. 5. List industrial use of water. f. Relate jobs to (e) 2. a. Draw from data obtained in Activity #1 b. List government jobs and private sector jobs 3. a. Interview persons in various jobs and report to class. b. List jobs according to schooling required. c. Write a job analysis for each job discovered. d. Take exploration trips to Millcreek Sewage Treatment Plant. 5. a. Relate increases of water consumption and pollution to increased population. b. Produce a skit tracing the movements of a drop of water from the Ohio River through a home water tap or through an industry back to the Ohio River (see investigation in "Our Environment Battles Water Pollution). Relate jobs along the line. c. Write U.S. government Printing Office to determine city, county, state and federal legislation regarding water standards. Discuss roles of persons who set, test and maintain standards	1. a. Yellow Pages b. Newspapers--classified section c. Water Pollution booklet Chas. Lavaroni & O'Donnell Addison-Wesley Pub. Co., Inc. d. Water Treatment booklet e. "Job Descriptions" (Attached) f. Film "Water" 27 min. MTPS 2. a. EPA Personnel Division 684-7454 b. Cincinnati Civil Service 352-3000 3. a. Pamphlet "Ohio's Environmental Health" Ohio Department of Health P.O. Box 118 Columbus, OH 43216 b. Cincinnati Water Works Laboratory 231-7825 c. "Drinking Water" Public Health Service pamphlet #956, U.S. Government Printing Office, Washington. 4. #5905 Water Pollution Detection Outfit $99.95 Educational Products Div. LaMotte Chemical Products Co., Chestertown, Md. 21620 includes the text for #5 "Our Environment

EXPLORATION ACTIVITY #5
(Continued)

WATER POLLUTION CONTROL

OBJECTIVES	ACTIVITIES	RESOURCES
	d. Role play a town meeting concerned with the need for halting pollution of the Mill Creek.	Battles Water Pollution" by Dr. Charles E. Renn.

WATER POLLUTION CONTROL (cont'd)

OBJECTIVES	ACTIVITIES	RESOURCES
6. Perform laboratory tasks that are routinely performed in water testing. (Sampling, organic content, chemical content)	6. a. Complete investigations of Water Pollution Detection Kit. b. Perform a bacterial count on several water samples brought to class. (esp. swimming pool)	
7. Evaluate your role in the field of water pollution control.	7. a. Select one job in the field and write the requirements needed to fulfill the job. b. Compose a letter to a public official or friend describing your attitude toward the need for water pollution control.	

25

WATER POLLUTION CONTROL

Health Laboratory Technician

Performs chemical and bacteriological analysis in a public health laboratory, a water treatment plant, or a sewage disposal plant. Works with samples of food, water, air and other substances.

Health Engineering Assistant

Acts as aide to consulting engineer in water supply development, treatment, and pollution control, as well as in refuse disposal.

Water Treatment Plant Operator

Controls treatment plant equipment to purify and clarify water for human consumption and industrial use. Adjusts flow of raw water into plant, performs tests, adds chemicals, filters water to remove impurities.

Sewage Plant Operator

Purifies waste water before it enters rivers, streams, or city mains.

Regulatory Technician

Will work for a local, state or federal agency. Responsibilities include stream monitoring, water and wastewater sampling and testing.

Design and Construction Technician

Working for consulting engineers or contractors, will assist in the design or construction of systems or treatment plants.

Instrumentation Technician

Is a specialist in the installation, operation, maintenance, and selection of controls and instruments used in the operations of water and wastewater treatment plants.

ASSISTANT SUPERVISOR OF WATER TREATMENT

DUTIES: This official assists the supervisor by taking immediate charge of the water treatment laboratory, supervising and assisting, as necessary, the chemical, bacteriological, microscopic and physical tests and observations performed. He makes studies of treatment methods and materials. He relieves the supervisor of administrative detail in compiling and verifying reports, ordering and stocking materials and equipment, conducting tours, supervising personnel, and other related tasks. He may represent the supervisor at meetings and conferences. He assumes duties of the supervisor in the absence of that official.

QUALIFICATIONS: Each applicant should have had four years' water treatment experience and operation of a large plant. He must have comprehensive knowledge of water treatment procedures and plant operation. He must be well-informed in laboratory operation and control, and be skilled in performance of all tests and determinations concerned with water treatment. He must possess a Class 3 or higher certificate for operation of water treatment plants as issued by the Ohio State Department of Health. Graduation from a university of recognized standing with a degree in chemistry, chemical engineering, sanitary engineering, or biology with a major in chemistry is required.

ASSISTANT SUPERINTENDENT OF MILL CREEK WASTEWATER PLANT

DUTIES: This employee assists the Superintendent of the Mill Creek Wastewater Plant in the administration, operations and maintenance of the Mill Creek Wastewater Plant. He directs the operations, maintenance and laboratory forces, reviews and evaluates operation records and laboratory data. He participates in the establishment of policies and procedures, assignment of duties and requisitioning of materials. He is responsible for the training of all new operators in basic wastewater treatment principles. He may substitute for the other Wastewater Plant Supervisor 1, 2, and 3 in the Division of Operations during vacation periods and extended illnesses. He works in close cooperation with other supervisors and superintendents in the Department of Sewers and coordinates his activities with the overall objectives of the department. He performs related duties as required.

QUALIFICATIONS:

Each applicant must have a Class III Certificate in Wastewater Treatment as issued by the Ohio Department of Health. He must have good knowledge of all treatment plants and facilities operated and maintained by the division. He must have demonstrated his capability and aptitude for management level responsibilities. He must have, or qualify for, an Ohio driver's license.

INDUSTRIAL WASTE ENGINEER

DUTIES: This employee is responsible for evaluations and reports involving the application of the Sewerage Service Charge and Industrial Wastes Surcharge Ordinances. He coordinates billing of industrial and commercial accounts with the city and independent political subdivisions, and may act in a liaison capacity with the municipal organizations served by the sewage disposal program. He correlates gauging and sampling operations to establish accurate billing. He evaluates technical and economic data. He determines sewerage service charges for individual industries from industrial wastes analyses. He coordinates and maintains data on outside sources of water supply, septic tank installations, and new sewers. He assists in communicating with industry on the various problems arising from the application of the Industrial Wastes Ordinances. He performs other related work.

QUALIFICATIONS: This employee must have sound practical knowledge of hydraulics, chemistry, and the waste products from industrial processes. He must be familiar with sanitary engineering and industrial wastes terminology and practice. Skill in establishing and maintaining effective contact and communication with personnel of city departments, other jurisdictions and private industry is highly desirable. He should have, or qualify for, an Ohio driver's license.

WATER TREATMENT PLANT OPERATOR 551.885

DUTIES: This employee operates and services water filters or chemical mixing equipment on an assigned shift. He takes filters in and out of service and keeps records of operating time. He takes meter readings and checks condition of filters in use. He washes filters as required. He checks the feed of chemicals into water, sees that prescribed rate of feed is maintained, and keeps records of consumption. As required, he lubricates flocculators and clarifiers, assists in changing chlorine and ammonia tanks, keeps working area clean, and performs other related work.

OPEN QUALIFICATIONS: Each applicant must have completed the tenth grade, or have a G.E.D. Certificate. Vocational training and previous mechanical experience are desirable. He must have good mechanical aptitude. He must be able to keep legible and accurate records and be able to make arithmetic computations using decimals and fractions. Willingness and ability to learn procedures of water treatment is expected. He must be willing to attend training classes, partly on his own time, to obtain a State of Ohio Class I Water Treatment Plant Operator certificate. He must be willing to work rotating shifts. He must have or qualify for an Ohio driver's license and be able to provide own transportation to plants not adequately served by public transportation.

WASTEWATER SAMPLER AND GAUGER 3

DUTIES: This employee directs a small crew in the collection of samples and the installation and removal of automatic wastewater sampling and gauging equipment in accordance with prescribed schedules and procedures. He oversees and assists in the installation of weirs, orifices, batteries, recording flow motors, scaffolds, shelters and related equipment. He fabricates weirs, bracing and similar items. He repairs or adjusts equipment as required. He makes basic tests of wastewater samples and of vapors. He orders supplies and sees that all tools, instruments and equipment are kept in good condition. He keeps personnel and test records, trains new men, maintains discipline and enforces good safety practices. He drives a light truck to transport crew and equipment and performs related work.

QUALIFICATIONS: Each applicant must have one year's experience in an eligible classification. He must have good mechanical aptitude and be able to understand basic hydraulic principles. Good knowledge of tools, equipment and instruments used in sampling and gauging is required. He must be able to maintain standards of accuracy and reliability in testing procedures and records. Ability to direct a small crew and maintain discipline is required. He must be physically strong and agile and be able to enter sewers by means of a rope ladder. Willingness to work rotating shifts and, occasionally, weekends and holidays is required. He must have, or qualify for, an Ohio driver's license.

WASTEWATER SAMPLER AND GAUGER 2

DUTIES: This employee obtains samples of wastewater throughout the metropolitan area either by use of an automatic wastewater sampler or manually and on a prescribed schedule. He fabricates weirs and enters sewers to install and remove them. When sampling and gauging automatically, he changes containers, takes readings on the flow recorder, checks and changes automotive batteries and reports on malfunctioning equipment. He helps to clean, maintain, load, unload and store the automatic sampler and related supplies. He helps to set up, maintain and dismantle sampling shelters. He may operate, observe and record readings of a current meter. He may work at a lower classification when doing manual sampling. He may be assigned to inspect sewers and to perform labor and custodial work in and around the wastewater disposal plants.

QUALIFICATIONS: Each applicant must have one year's experience in an eligible classification. He must have ability to work with fractions and decimals and be able to read and accurately record measurements obtained with sampling and gauging equipment. He must be physically strong and agile and be willing to enter sewers by means of a rope ladder. He is required to work rotating shifts and occasionally on weekends and holidays. He must have, or qualify for, an Ohio driver's license.

WASTEWATER SAMPLER AND GAUGER 1

DUTIES: This employee obtains samples of wastewater throughout the metropolitan area either manually or by use of an automatic wastewater sampler and on a prescribed schedule, observes and records volume and rate of flow as measured by weirs, meters or other devices. He enters manholes to help install and remove equipment, change sample containers and to take readings. He helps to set up and dismantle sampling shelters and to clean, maintain, load, unload and store sampling and gauging equipment. He may be assigned to inspect sewers and to perform miscellaneous labor and custodial work in and around the Wastewater Disposal plants.

OPEN QUALIFICATIONS: Each applicant must have completed the eighth grade. He must be capable of doing simple arithmetic and be able to read and record measurements obtained with sampling and gauging equipment. He must be physically strong and agile and be able to enter sewers through manholes by means of a rope ladder. Willingness to work rotating shifts and, occasionally, weekends and holidays is required. He must have, or qualify for, an Ohio driver's license.

WASTEWATER PLANT SUPERVISOR 3

DUTIES: This employee is responsible for the administration, operation and maintenance of the Little Miami Wastewater Treatment Plant, 4-Mile Treatment Plant, Dry Run Treatment Plant and any package treatment plants and package lift stations assigned to him. His duties include the direction of the operation, maintenance and laboratory forces, scheduling of plant operations, review and evaluation of operating records, analysis of laboratory data and its application to treatment, training of personnel, requisitioning of material, preparation of plant budget and other administrative duties. He is responsible for the establishment, review and modification of procedures and policies for the operation and maintenance of all facilities assigned to him. He works in close cooperation with other supervisors and superintendents in the Department of Sewers and coordinates his activities with the overall objectives of the department. He performs related duties as required.

QUALIFICATIONS: Each applicant must have a Class III Certificate in Wastewater Treatment as issued by the Ohio Department of Health. He must have a good knowledge of plant maintenance problems. He must have demonstrated his capability and aptitude for management responsibilities. He must have or qualify for an Ohio driver's license.

WASTEWATER PLANT SUPERVISOR 2

DUTIES: This employee is responsible for the administration, operation and maintenance of either the Muddy Creek or Sycamore Wastewater Treatment Plant and any package lift stations and package treatment plants assigned to him. His duties include the direction of the operation and maintenance forces, scheduling of plant operations, review and evaluation of operating records, analysis of laboratory data and its application to treatment, training of personnel, requisitioning of material, preparation of plant budget and other administrative duties. He is responsible for the establishment, review and modification of procedures and policies for the operation and maintenance of all facilities assigned to him. He works in close cooperation with other supervisors and superintendents in the Department of Sewers and coordinates his activities with the overall objectives of the department. He performs related duties as required.

QUALIFICATIONS: Each applicant must have a Class III Certificate in Wastewater Treatment as issued by the Ohio Department of Health. He must have good knowledge of plant maintenance problems. He must have demonstrated his capability and aptitude for managment responsibilities. He must have, or qualify for, an Ohio driver's license.

WASTEWATER PLANT SUPERVISOR 1

DUTIES: This employee is responsible for the operation and maintenance of numerous lift stations and package treatment plants in an assigned area. His duties include training and supervising of operating and maintenance personnel, evaluation of operating records and laboratory data, and the establishment of procedures and policies for the operation and maintenance of package treatment plants and lift stations. He works in close cooperation with other supervisors and superintendents in the Department of Sewers, and coordinates his activities with the overall objectives of the department. He may be required to perform other related duties.

QUALIFICATIONS: Each applicant must have a Class II, or higher, certificate as a Wastewater Treatment Plant Operator issued by the Ohio Department of Health. He must be able to prepare clear and accurate records and reports. He must know how to train, coordinate, and supervise an operating staff. He must have good knowledge of the maintenance needs and problems associated with package treatment plants and lift stations. He must have, or qualify for, an Ohio driver's license.

WASTEWATER PLANT OPERATOR 4

DUTIES: This employee is a Chief Operator, in charge of all wastewater treatment operational personnel on an assigned shift at Mill Creek Treatment Works. He oversees and coordinates the work of the wastewater plant operating units and rules in deviations and exceptions to prescribed procedure. He makes tours of inspection of the plant, checks operating reports, the condition of machinery, equipment, and other facilities, and reports on any need for repair or replacement. He sees that adequate supplies of chemicals and other materials are on hand and available for use. He participates in the training of personnel, schedules their assignments and reviews their performance. He cooperates with the maintenance foreman in carrying out preventive maintenance routines and with the Safety Coordinator in developing and enforcing safe work practices. He may conduct visitors through the plant and does other related work.

Open Examination

QUALIFICATIONS: Each applicant must have a least three years' experience in wastewater treatment plant work, including at least one year in a supervisory capacity, and possess a Class II or higher certificate as a wastewater treatment plant operator as issue by the Ohio Department of Health, or hold the equivalent of a Class II certificate from another state. He should have a fundamental understanding of wastewater plant hydraulics, design of treatment facilities, and have detailed knowledge of all phases of wastewater plant operation. He must be able to prepare clear and accurate records and reports. He must know how to train, coordinate and supervise on operating staff. He must have good knowledge of plant maintenance needs and problems, and be able to work effectively with other supervisors. He must be willing and qualified to drive a vehicle as needed and work rotating shifts.

Promotional Examination

QUALIFICATIONS: Each applicant must have at least one year of experience as a Wastewater Plant Operator 3. He must possess a Class II or higher certificate as a wastewater treatment plant operator issued by the Ohio Department of Health. He should have a fundamental understanding of wastewater plant hydraulics, design of treatment facilities, and have detailed knowledge of all phases of wastewater plant operation. He must be able to prepare clear and accurate records and reports. He must know how to train, coordinate and supervise an operating staff. He must have good knowledge of plant maintenance needs and problems, and be able to work effectively with other supervisors. He must be willing and qualified to drive a vehicle as needed and work rotating shifts.

WATER TREATMENT PLANT FOREMAN

DUTIES: This employee supervises the operation of the water treatment plant complex on an assigned shift. He regulates the supply of filtered water to meet system consumption demands, computing the changes necessary to adjust the chemical food machines to that volume. He directs all treatment processes such as operation of filters, flocculators, clarifiers, sludge removal pumps, and all other equipment. He ascertains that the volumes of water are in proper balance at the various stages of treatment and makes physical checks on the quality of the water for proper taste, odor, and clarity. He is responsible for all operations involving handling and use of ammonic and chlorine. He takes numerous readings such as basin levels, rainfall, temperature, and filter rates and records significant data in a permanent log. He directs immediate changes and alterations to maintain service in case of malfunction. He receives visitors and is responsible for overall plant security. He maintains records and prepares reports of personnel and operations. He performs other related work as required.

QUALIFICATIONS: Each applicant must have two years' service as a water treatment plant operator. He must have a State of Ohio Class I Water Treatment Plant Operator certificate and be willing to work toward a Class II certificate. He must be thoroughly familiar with all methods, processes, and equipment used. Supervisory ability is essential. He must have or qualify for an Ohio driver's license and be able to provide own transportation to plants not served by public transportation.

ASSISTANT SUPERINTENDENT OF SEWERS OPERATIONS

DUTIES: This employee assists the Superintendent of Operations in the administration, operation and maintenance of all wastewater treatment works, package plants and pumping stations in the Metropolitan Sewer District of Greater Cincinnati; in the administration, operation and maintenance of the Barrier Dam Flood Control Facilities; and in the administration and operation of the industrial waste laboratory and the stream survey program. He participates in the establishment of Division policies and procedures. He works in close cooperation with other supervisors and superintendents in the Department of Sewers and coordinates his activities with the overall objectives of the department. He performs related duties as required.

QUALIFICATIONS: Each applicant must have a Class III certificate in Wastewater Treatment as issued by the Ohio Department of Health. He must be a graduate of a recognized engineering college and hold a degree in civil, sanitary, chemical or mechanical engineering and be a registered professional engineer in the State of Ohio. He must have demonstrated his capability and aptitude for management level responsibilities. He must have or qualify for an Ohio driver's license.

ASSISTANT SUPERINTENDENT OF WATER SUPPLY

DUTIES: This employee assists and understudies the Superintendent of Water Supply in the management of the Division, and acts for him in his absence. He is responsible for pumping operations, and for maintenance and repair of all division machinery, equipment, buildings and installations, and for improvement and upkeep of grounds. He acts as division personnel officer, overseeing the appointment, training, assignment, performance and evaluation of employees, investigating disciplinary matters and reviewing staffing and work organization. He participates as assigned in inspection and testing of new equipment and commodities, development of specifications, control of inventory, and planning of new or enlarged facilities. He performs related technical and administrative staff work.

QUALIFICATIONS: Each applicant must have two years' service as engineer or higher and have, or be able to qualify for registration as a professional engineer in the State of Ohio within his one year probationary period. He must have, or be able to qualify for a license from the State Board of Health to supervise water distribution work. Capacity for administrative staff work and executive responsibility is essential. He should be well-informed on the technical and practical aspects of water supply operations and maintenance, and be able to plan and direct such work effectively. He should have interest and energy in developing training programs, and in reviewing work methods and organization for feasible improvements. He should have aptitude for personal contacts at the administrative and policy level and be able to write reports and correspondence.

ASSISTANT SUPERINTENDENT OF WATER DISTRIBUTION

DUTIES: This employee assists the Superintendent of Water Distribution in the management of the division, understudies the Superintendent, and acts as Superintendent in the latter's absence. Routinely he has the primary responsibility for the engineering design of new distribution systems, mains, and appurtenances. This responsibility includes providing for necessary rearrangement of facilities to accomodate other public improvements as well as planning new distribution facilities to meet future needs for water within the service area. He represents the Water Works in negotiations with other City Departments, State Highway Department, and Federal Bureau of public Roads. He assumes immediate responsibility for the performance of the engineering staff, and assists in the supervision of the various operating sections of the division. He may be called upon to make special studies and reports in any phase of water distribution work and to assume any responsibility in emergencies.

QUALIFICATIONS: Each applicant must have two years' service as Engineer or higher and have, or be able to qualify for registration as a professional engineer in the State of Ohio within his one year probationary period. He must have, or be able to qualify for, a license from the State Board of Health to supervise Water Distribution work. He must have thorough knowledge of hydraulics in relation to a water distribution system with several pressure levels and varying hydraulic gradients. He must be thoroughly familiar with the properties of pipe, values, pressure regulations, gauges, and other appurtenances to a distribution system. He must have supervisory and administrative ability. He must be able to drive a car in the performance of these duties and have a valid Ohio driver's license. Willingness to work irregular hours to meet the needs of the system is essential.

WASTEWATER PLANT OPERATOR 3

DUTIES: This employee performs or oversees the operation of any of the various processes in a wastewater treatment plant. He relieves regular operators in such tasks as wastewater and sludge pumping and sampling, adjusting control mechanisms, setting valves, lubricating machinery, keeping records, and writing reports. He may be assisged to oversee all operating personnel on a shift in performance of such work. He sees that current procedures are followed and safety precautions observed. He may be assigned to conduct visitors through the plant. He serves as relief and substitute for a Chief Operator (Wastewater Plant Operator 4) as needed and performs other assigned work.

Open Examination

QUALIFICATIONS: Each applicant must have at least three years' experience in general plant machinery operation and operating maintenance including two years in wastewater plant operation, and have a Class I or better certificate as a qualified wastewater treatment plant operator issued by the Ohio Department of Health. He must be familiar with the equipment, methods and operating practice in all phases of wastewater treatment. He must have supervisory capacity. He must be willing and qualified to drive a car or light truck and to work rotating shifts.

Promotional Examination

QUALIFICATIONS: Each applicant must have at least one year of experience as a Wastewater Plant Operator 2 and have a Class I or better certificate as a qualified wastewater treatment plant operator issued by the State of Ohio Department of Health. He must be familiar with the equipment, methods and operating practice in all phases of wastewater treatment. He must have supervisory capacity.

WASTEWATER PLANT OPERATOR 2

DUTIES: This employee typically is responsible for proper operation and control of wastewater plant facilities such as pumping, grit removal and screening, sludge pumping and chemical handling, sludge digestion and sludge disposal. He checks the proper operation and/or adjustment of motors, valves, compressors, chemical feeders, screens, conveyors, filters, and other components of the wastewater treatment process. He collects samples for analysis. He notes and records the readings of gauges, meters and other control instruments. He inspects, lubricates and reports on condition of equipment and machinery, and performs other maintenance and cleaning duties. He instructs and directs a helper (Wastewater Plant Operator 1) if his position requires more than one operator. He may do some driving of light vehicles incident to plant operation duties.

Open Examination

QUALIFICATIONS: Each applicant should have at least two years' experience in the operation and operating maintenance of mechanical equipment with at least one year of such experience in a wastewater treatment plant. He must be able to keep legible and accurate records and be able to do arithmetic of average difficulty. A high school education or equivalent is required. Ability and willingness to qualify for a State of Ohio Class I Wastewater Treatment Plant Operator certificate is expected. He must be able and willing to drive a light vehicle as needed in the performance of his duties and have a current Ohio driver's license. He must be willing to work rotating shifts.

Promotional Examination

QUALIFICATIONS: Each applicant should have at least two years' experience in the operation and operating maintenance of mechanical equipment including at least one year of service as a Wastewater Plant Operator 1. He must be able to keep legible and accurate records and be able to do arithmetic of average difficulty. A high school education or equivalent is required. Ability and willingness to qualify for a State of Ohio Class I Wastewater Treatment Plant Operator certificate is expected. He must be able and willing to drive a light vehicle as needed in the performance of his duties and have a current Ohio driver's license. He must be willing to work rotating shifts.

WASTEWATER PLANT OPERATOR 1 - 955.782

DUTIES: This employee performs routine duties in the operation of a wastewater treatment plant, usually assisting an experienced operator. He collects wastewater samples, starts and stops equipment, opens and closes valves, replenishes chemical solution tanks, takes readings, unloads chemicals and performs other related duties. He assists in lubrication of machinery and other preventive maintenance. He helps keep machinery and work areas clean. He may do some driving of light vehicles incident to plant operation duties.

QUALIFICATIONS: Each applicant must have at least one year's experience in the operation and operating maintenance of mechanical equipment, OR he must have completed a technical program at the high school level, or in a Manpower Development Training program. He must have better than average mechanical aptitude. He must be able to do simple arithmetic. He must be willing to work rotating shifts. A high school education, or equivalent is desirable. Willingness and ability to learn routine procedures of wastewater treatment are expected. He must have or qualify for an Ohio driver's license.

SUPERVISOR OF WASTEWATER SAMPLING & GAUGING

DUTIES: This employee is in charge of the program of sampling and gauging sanitary and industrial liquid wastes. He assigns crews, sets up and inspects stations, designs or adapts weirs to fit particular sewage flow, sees that prescribed samples are taken and measurements made, adapts standard methods to special conditions and supervises use of gauging instruments. He inspects industrial plants and confers with plant engineering and supervisory personnel to identify sources of waste, number of outlets and normal volume and character of sewage. He prepares sewage flow charts and adapts standard charts to special conditions. He trains and instructs Samplers and Gaugers, makes up work schedules, keeps absence reports, investigates accidents and misconduct, sees that supplies and equipment are properly used and performs other related work.

QUALIFICATIONS: Each applicant must be familiar with policy and procedure governing sewage gauging and sampling work. He must have knowledge and skill in setting up stations for efficient and safe work and in using instruments and procedures for reliable measurements. He must be able to investigate origin and nature of industrial wastes and determine cause of abnormal measurements and samples. He must have supervisory ability and be able to meet and confer with engineering, technical and administrative personnel, public and private. He must be able to interpret plats and other sewer records, to prepare flow charts and submit clear and accurate reports. He must be willing to work irregular hours when necessary.

PUMPING STATION OPERATOR
(Water Supply)

DUTIES: This employee supervises the operation of an electric powered water pumping station and a group of remotely controlled pumping stations and/or valve control stations on an assigned shift. He plans, coordinates, and directs pumping operations to supply normal water output and to meet unusual or emergency conditions. He inspects the operation and condition of machinery and equipment, logs meter and gauge readings and takes note of any malfunction and need for repair. He directs and helps perform any running repair, maintenance, or adjustment of machinery and equipment. He oversees the work of subordinates assigned to his watch and sees that machinery is kept properly lubricated and clean. He is immediately responsible for plant heating, ventilating and air conditioning systems, for proper use and custody of tools and supplies and security of the plant during his watch. When not assigned to a regular shift he may perform a variety of more difficult and responsible machinery and repair.

QUALIFICATIONS: Each applicant must have successfully completed the prescribed training program for Class I Operator, Water Distribution System. He must have become licensed by the State of Ohio within one year. He should have good knowledge of the operating, maintenance and repair of steam and electric powered pumps and auxiliary equipment. A basic understanding of hydraulics relating to water supply and practical knowledge of electrical equipment, such as motors, switchgear, relays, etc., is desirable. Mechanical aptitude and manual skill in repair and maintenance is essential. A high school education with some college level work in mechanical or electrical engineering is desirable. He must have an Ohio driver's license.

SANITARY BIOLOGIST-BACTERIOLOGIST
(Water Pollution Control)

DUTIES: This employee is the professional level biologist-bacteriologist in immediate charge of the Stream Survey Laboratory. He supervises and performs analyses of streams together with sewage and industrial wastes. He makes interpretations and streams forecasts based on these analytical results. He advises the Superintendent of Treatment on the continuing condition of the Ohio River and recommends the degree of wastewater treatment. He cooperates with state and federal stream pollution agencies to maintain water quality by making surveys and analyses, recording data and making reports. He investigates bacteria and other micro-organisms and performs all necessary tests and research. He makes plankton and bottom-sediment counts, prepares cultures and completes other water quality tests. He does all necessary bacteriology. He keeps detailed test records, analyses and interprets assembled statistics, prepares comprehensive reports and makes recommendations regarding his findings.

QUALIFICATIONS: This employee must have a bachelor's degree with a major in sanitary micro-biology together with a minimum of 20 credit hours in chemistry. He must have two years' experience in a biological or bacteriological laboratory, with six month's experience in practical aquatic biology. He must be familiar with the biology of wastewater treatment. Supervisory ability is required. An interest in the basic sciences fundamental to sanitary engineering is desirable. Knowledge of out-board motor operation and Coast Guard regulations are desirable. He must have, or qualify for, an Ohio driver's license.

Exploration Activity #6

SOLID WASTE DISPOSAL

OBJECTIVES	ACTIVITIES	RESOURCES
Students will be able to: 1. Identify solid waste materials our society produces, and how they are handled until decomposition takes place. 2. Identify jobs that are involved with the disposal of solid waste. 3. Analyze the jobs identified 4. Investigate the jobs connected with solid waste recycling. 5. Evaluate the jobs investigated in this packet in terms of their necessity to our community.	1. a. List (or bring into class) items discarded at home within the past week. b. Interview a school custodian to find out what things are discarded and where they are taken. c. Inquire of city garbage collector what is maximum size article collected and where the trucks are emptied. d. Suggest disposal of such things as automobiles, refrigerators, furniture, materials from torn down buildings, etc. e. Analyze problems associated with solid waste disposal and suggest alternatives. f. Discuss city ordinances related to solid waste disposal. 2. a. Interview school custodian b. Interview a city garbage collector c. Telephone the city incinerator for information about operation. d. Search "white pages" of phone book to find city departments involved in solid waste collection and disposal. e. Contact city litter control inspector and ask about other inspector jobs. f. Locate private waste disposal operators in Hamilton County. g. Discuss the role of salvagers in solid waste disposal. h. Posters i. Clean-up campaign	1. School custodian Films: #4141 "The Second Side" 14 min. #3838 "The Trouble with Trash" 28 min. #4397 "The San Diego Experience" 17 min. (M.T.P. Service) 2. Telephone Books City incinerator supervisor, Mr. Beeker 352-3691 Litter control inspector (phone for ordinances) 352-3000 Career description lists. (Attached) "Managing our Environment" U.S. Dept. Agriculture Bulletin #351 75¢ Supt. Documents Washington, D.C. 20402

SOLID WASTE DISPOSAL (cont'd)

OBJECTIVES	ACTIVITIES	RESOURCES
	3. a. Listen to and question a speaker to determine job analyzis of an industrial waste engineer or a private refuse collector. b. Assemble data collected from interviews with custodian and garbage collectors during their lunch hours. c. Telephone as many businesses and city superintendents as possible to complete job analyses. d. Telephone Environmental Protection Agency Solid Waste Research Division and report to class the nature of the jobs available with them.	Film "The Third Pollution" Contact Mr. Paul Young, route supervisor 352-3691 (garbage collector) EPA 5555 Ridge Avenue Phone 684-4361
	1. Contact "Cincinnati Experience"	Franklin, OH
	2. Locate Hamilton County businesses that handle solid waste for recycling.	
	3. Make posters describing recycling jobs-distribute throughtout school.	Game-Recycling-Resources
	List all jobs identified in the packet. Delete two of these jobs and describe the consequences to the community.	Ecology kit furnished by Continental Can Co., NY

40

LABORER
GARBAGE COLLECTION HELPER
LABOR UTILITYMAN

DUTIES: This employee may be assigned to work in any of the various city departments or divisions or for the Board of Eduction. He performs manual labor in the maintenance of: the grounds and facilities of parks, nurseries, recreation areas, schools, plants, buildings, garages and incinerators, streets, alleys, bridges, curbs, guard fences, steps, walls and sewers. He may perform, but is not restricted to, such general duties as cutting and caring for grass and shrubbery, cleaning up debris, cleaning floors, walls and equipment, loading, unloading and transferring materials, excavating, backfilling, cleaning snow from walks, steps and driveways and assisting mechanics, operators, craftsmen and maintenance men. He may perform, but is not restricted to, such specific duties as setting up and helping to repair recreation equipment, marking athletic fields, using hand and power tools to break and remove paving materials, resetting manhole castings, salting and sanding slippery streets, collecting garbage and setting out full cans to the curb line, helping install and repair water mains and routine servicing on cars, trucks and motor equipment by pumping gas, changing oil and mounting skid chains. He may be occasionally assigned to drive a light truck or to ferry larger trucks between garages and yards. He may be required to keep simple written records. He does related work as required.

QUALIFICATIONS: Each applicant must have one year of work experience, OR be a high school graduate, OR have one year of active military service, OR have completed a course in work training at an Opportunities Industrialization Center. He must be able to read and write. He must have or qualify for an Ohio driver's license.

AGE: 18-59 - Garbage Collection Helper
18-49 - Labor Utilityman

Consolidation of Laborer	(Garageman)	Laborer	(Recreation)
"	(Garageman-Police)	"	(Seasonal)
"	(Highway Maint.)	"	(Trench)
"	(Park)	Garbage Collection Helper	
"	(Plant)		

GARBAGE COLLECTION FOREMAN

DUTIES: This employee is in charge of waste collection in an assigned district. He supervises several collection crews. He checks the crews out, arranges substitutes for absentees, and keeps attendance records. He makes field inspections of the progress of the work, checks causes of delay, and investigates complaints of improper service. He verifies and reports on any unusual waste collection conditions in his district and may recommend changes in routes or number of crews. He makes service ratings on his men, enforces efficient and safe methods of work, and recommends disciplinary action when necessary. He reviews daily work reports, coordinates his work with other foremen and supervisors, and does related supervisory work.

OPEN QUALIFICATIONS: Each applicant must have three years' experience supervising a labor, or similar type work crew. Graduation from high school is required. He must have ability to interpret policies and procedures and to supervise, evaluate, and train waste collection men. He should have discretion and judgment in contacts with the public, and have aptitude for obtaining essential facts on investigation of complaints or unusual conditions. He should have good knowledge of traffic laws and safety practices. A knowledge of care and operation of heavy-duty trucks and equipment is desirable. He must prepare simple reports promptly and accurately. He must be familiar with the street layout, traffic patterns, and geographical make-up of Cincinnati. He must be able to drive a car as required in the performance of these duties and have a current Ohio operator's license.

PROMOTIONAL QUALIFICATIONS: Each applicant must have successfully completed the divisional training program. He must have the ability to interpret policies and procedures and to supervise, evaluate, and train waste collection men. He should have discretion and judgment in contacts with the public, and have aptitude for obtaining essential facts on investigation of complaints or unusual conditions. He should have good knowledge of traffic laws and safety practices. A knowledge of care and operation of heavy-duty trucks and equipment is desirable. He must prepare simple reports promptly and accurately. He must be familiar with street layout, traffic patterns, and the geographical make-up of Cincinnati. He must be able to drive a car as required in the performance of these duties and have a current Ohio operator's license.

LITTER CONTROL INSPECTOR

DUTIES: This employee inspects public walks, streets, and other areas for violations of the city's litter and waste control ordinances. He attempts to secure voluntary compliance with the provisions of the ordinances. He issues violation notices or citations to court to individuals refusing to comply. He assists in planning and arranging meetings with various civic organizations to enlist their cooperation on litter control. He checks Courthouse records to identify owners of property involved in litter violations. He prepares reports and maintains records necessary to the operation of the litter control program. He operates a camera on limited occasions. He performs other related work.

QUALIFICATIONS: Each applicant must be a high school graduate. He must be able to understand and explain to property owners, managers, tenants, contractors and similar members of the public, various city ordinances, rules and policies which govern the control of litter, rubbish and waste on city rights-of-ways and other public property. He must be able to keep notes and prepare written reports as required. Firmness, tact, discretion, clear speaking voice and neat appearance are important personal traits in successful performance of the duties of this position. He must be able to drive a car as needed in performance of these duties and must have a current Ohio operator's license.

SUPERVISOR OF INCINERATORS

ELIGIBILITY: All employees of the Waste Collection Division who have had two years of city employment as classified foreman, and who have the other qualifications listed below, are eligible to compete. (No employee shall be deemed eligible for a promotional examination whose last service rating was lower than 80%. Civil Service Commission Rule XI, Sec. 2.)

DUTIES: This employee directs the operation and maintenance of Waste Collection Division incinerators. He is responsible for maintaining established combustion schedules and policies and for obtaining best utilization of existing facilities. He reviews work procedures, organization and assignment and makes necessary changes to procure best operation. A major responsibility is to secure safe and productive work performance, and to promote efficiency, discipline and morale of his work force. He reviews such reports as condition of incinerator premises, and equipment, employee attendance, service ratings, tonnage of combustible waste and investigates unusual conditons. He approves the incinerator section payroll, salary step-ups, leaves of absence and similar personnel transactions. He interviews new employees. He conducts hearings on employee grievances. He investigates employee violations of rules and regulations and initiates disciplinary action if necessary. He confers with and advises foremen on interpretation and application of rules, procedures and policies. He inspects incinerator buildings, installations and equipment and advises on essential maintenance and repair. He oversees inspection of all combustibles delivered by private firms and individuals and enforces safe procedure for all vehicles using the incinerator. He advises private firms on waste disposal problems, and makes special arrangements for handling hazardous or confidential waste. He prepares correspondence and reports, assists in budget preparation, and does other related administrative work.

QUALIFICATIONS: Each applicant should have demonstrated capacity for supervisory work. He should be familiar with procedures for control and review, delegation of authority, measurement of work performance, use of records and reports, and other aspects of supervision. He should have aptitude for personal contacts and be able to provide leadership and direction to a work force of about 100 men. He should have basic knowledge of incinerator construction and operation and be familiar with field collection procedures and policies. He should be able to train men. Familiarity with established personnel procedures, rules and policies is expected. A high school education is desirable. He must be able to drive a car as needed in performance of these duties and must have a current Ohio operator's license.

INCINERATOR FOREMAN

DUTIES: This employee is responsible for the operation and maintenance of a Waste Collection Division incinerator. He is responsible for maintaining established combustion schedules and policies and for obtaining the best utilization of existing facilities. He investigates work procedures, organization, and assignments and makes the necessary changes to secure the best operation of the plant. A major responsibility is to secure safe and productive work performance and to promote efficiency, discipline, and morale of his work force. He investigates and reports to his supervisor on conditions of the incinerator premises and equipment, employee attendance, tonnage of combustible waste, and unusual conditions in the operation of the plant. He investigates employee violations of rules and regulations and initiates disciplinary action if necessary. He confers with his supervisor on interpretation and application of rules, procedures and policies. He performs other related work as required.

OPEN QUALIFICATIONS: Each applicant must have some experience supervising manual work. High school graduation is required. He must have ability to interpret rules, policies and procedures and to recommend improvements in operations or methods. He must know how to promote efficiency, maintain discipline and morals, teach safe practices, and evaluate work performance. Ability to schedule men and equipment is required. He must have some mechanical interest and ability. He must have aptitude for public contacts, be able to answer complaints and write simple reports. A general knowledge of city streets is required. Knowledge of incinerator and truck operations and care is desirable. Willingness to work any assigned shift is necessary. He must be able to drive a car as required in the performance of these duties and have a current Ohio operator's license.

PROMOTIONAL QUALIFICATIONS: Each applicant must have two years of service as a Special Laborer or higher. He must have good knowledge of incinerator operator and waste collection method. He must be able to supervise a crew of men and maintain good work practices and discipline. He must be able to maintain records and make simple written reports. A high school education is desirable.

INCINERATOR CRANE OPERATOR 2

DUTIES: This employee operates any crane used by the Division of Waste Collection in its incinerator program. He is responsible for over-all care and maintenance of the cranes. He periodically inspects and lubricates the equipment, replacing worn parts and informing his supervisor if major repairs are needed. He stocks replacement parts and lubricants and informs superiors when supplies are needed. He may be designated as instructor for new operators. When crane is not being used he may be assigned other work around the incinerator.

QUALIFICATIONS: Each applicant must have one year of service as an Incinerator Crane Operator 1. He must be familiar with the mechanism of all cranes and be able to do maintenance work of average difficulty. He must be willing to work shifts.

A training program in crane operation and maintenance will be provided for all eligible Crane Operator 1's prior to the examination.

INCINERATOR CRANE OPERATOR 1

DUTIES: This employee operates on overhead traveling electric crane using a clamshell bucket to distribute garbage in a storage pit and to deposit it in the charging hopper of an incinerator. He cleans and lubricates the equipment and does emergency repairs and replacement of simple parts. He may be required to assist in training new operators. When crane is not being used he may be assigned maintenance work around the incinerator.

OPEN QUALIFICATIONS: Each applicant must be experienced in the operation of an overhead crane and be skilled in the use of a clamshell. He must be familiar with the working parts of an overhead crane and be able to do simple maintenance. He must be willing to work shifts.

PROMOTIONAL QUALIFICATIONS: Each applicant must have mechanical aptitude and be able to perform simple maintenance. He must successfully complete a training program in the operation of an electric crane to be conducted by the Supervisor of Incinerators. He must be willing to work shifts.

ASSISTANT SUPERINTENDENT OF WASTE COLLECTION

DUTIES: This employee assists in the direction and administration of the Waste Collection Division by assuming immediate responsibility for such primary functions as supervision and coordination of field activities, personnel management, and budgeting. He coordinates the work of the section supervisors, gives instructions, interprets policies, and helps solve problems in their areas. He inspects work operations, equipment, and facilities and formulates new methods to improve service and effectiveness. He recruits and interviews new employees, hears grievances, promulgates rules and regulations. He sets up and conducts training programs, coordinates safety practices and activities, and enforces adequate attendance controls. He supervises the installation of additions and/or renovations to present facilities. He assists in planning the Division's future requirements and in the preparation of the annual budget requests. He also prepares Divisional reports and answers customer complaints. He assumes charge of the Division in the absence of the Superintendent.

QUALIFICATIONS: Each applicant must have a thorough knowledge of waste collection and disposal methods and municipal personnel and accounting practices. He must be familiar with Waste Collection Division organization, policy, and objectives. Administrative ability to plan, organize, set up training programs, conduct research studies, direct and control the utilization of personnel, equipment, and facilities is essential. Personal integrity and willingness to assume responsibility are essential. He must be willing to drive a car in the performance of his duties and have a current Ohio operator's license.

Exploration Activity #7

AIR POLLUTION CONTROL

OBJECTIVES	ACTIVITIES	RESOURCES
Students will be able to:		
1. List kinds and sources of air pollutants to determine jobs that are involved with their control.	a. Read materials on air pollutants b. Watch films on air pollution c. List the workers shown in the films and the jobs generated by the control of pollutant emissions.	a. "Air Pollution Control in Cincinnati" city of Cincinnati., pamphlet (class set) b. Pamphlet "The Cleaner Air Commitment" by Air Pollution Control of Greater Cincinnati (class set) c. Films: "Something in the Air" M.T.P.S. "The Answer is Clear" M.T.P.S.
2. Investigate city air pollution control ordinances and city positions which relate to the implementation of these ordinances.	a. Read job description lists b. Purchase revised ordinance booklet and list jobs necessary to implement these ordinances	d. Air Pollution, booklet by Lavaroni & O'Donnell Addison-Wesley Pub. Co. Menlo Park, Calif.
3. Identify jobs with private businesses that relate to air pollution control.	2. Search "Yellow Pages" for businesses involved with pollutant emissions, analysis, and control.	2. a. Career description lists (Attached) b. City Air Pollution Control Division 1675 Gest Street Mr. Ermenc or Mr. Robert Shaw 352-4880
4. Analyze jobs involved with air pollution control	a. Interview workers at private businesses (via phone and individual contact) b. Listen to and question a city air pollution control inspector c. Role play an air pollution control inspector confronting a businessman accused of a violation.	3. Yellow Pages a. laboratories, analytical b. air pollution control
5. Investigate some skills used by air pollution controllers.	a. Build a model Cottrell precipitator b. Collect samples of air pollutants and compare samples taken at various locations on different days c. Analyze data collected in #2 d. Test the effects of sulphur dioxide on plants and analyze data e. Play the "Pollution Game" and duscuss results f. Discuss the hazards of smoke stack climging to obtain samples	
6. Complete several activities which involve you personally in preventing air pollution.		
7. Evaluate this packet in terms of the job to which you could qualify.		

AIR POLLUTION CONTROL (cont'd)

OBJECTIVES	ACTIVITIES	RESOURCES
49	6a. Don't burn leaves or trash b. Start a compost heap c. Plant a tree d. Use a hand mower for a lawn mower if your lawn is small. e. Be careful with matches and cigarettes, Don't start fires needlessly f. Walk, bicycle or use mass transit whenever possible. When you do drive, don't leave engine running while car is parked. g. Discuss equipping cars with anti-pollution devices and maintaining the devices h. Write article for school newspaper in support of air pollution control. 7a. Select a job for which you qualify and write its qualifications and description of tasks you will need to perform.	4. a. Speaker available from City Air Pollution Division. Call Mr. Ermenc, 352-4880 b. Teacher must send letters beforehand advising businessmen of future student contact. "Air Pollution" Lavaroni & O'Donnell <u>Man and the Environment</u> Educational Research Council of America-Houghton Mufflin Co. pp 356-362 pp. 371-372 "The Pollution Game" Houghton Mifflin Co. "71 things you can do to stop pollution" from Air Pollution Control League 18 E. 4th Street 45202 Mr. Charles Howison

Ordinance #420-1969

ARTICLE XIX, Section 6. Division of Air Pollution Control

There is hereby established, within the department of sewers, a division of air pollution control to be administered by the air pollution control engineer. It shall be the duty of the air pollution control engineer to supervise the execution of the laws, ordinances, rules and regulations pertaining to air pollution control and pertaining to the installation, reconstruction, replacement, alteration, use and periodic inspection of air pollution equipment and mechanical equipment as such equipment is defined by the building code of the City of Cincinnati and to perform such other duties as may be assigned to him by or pursuant to ordinance.

Passed: December 3 A.D., 1969

AIR POLLUTION CONTROL

APPRENTICE LABORATORY TECHNICIAN

DUTIES: Clean-up work, packaging, testing, write reports field sampling on smoke stacks. ?.20/hr

AIR POLLUTION CONTROL AND HEATING ENGINEER

DUTIES: This official is head of Air Pollution Control and Heating Inspection activities. He is responsible for a comprehensive program of enforcement of municipal ordinances for the abatement of atmospheric pollution and for the prevention or reduction of hazards of fire, explosion and fumes related to installation and operation of fuel-buraing and related mechanical equipment. He oversees engineering review of all equipment installation or modification plans. He directs a staff of field inspectors and develops inspection methods, reports and records. He authorizes sealing of defective equipment and prosecution of violators. He is responsible for briefing other city department personnel who assist in some aspects of the program. He evaluates air sampling and measurement of general and specific pollutants and arranges for investigation of air pollution and fuel-burning equipment complaints. He works with officials of industrial, commercial and real estate interests to correct major causes of air pollution. He cooperates with other public agencies and private organizations in abatement of air pollution. He negotiates agreements with neighboring communities to provide and coordinate pollution control services. He acts as chief technical advisor to the city administration and council with respect to methods, evaluation, policies and legislation involved in control of air pollution and enforcement of safe fuel-burning equipment practice. He develops and recommends appropriate legislation. He is responsible for preparation of the bureau budget, and maintenance of all necessary records, preparation of reports and correspondence, and for the appointment, training and performance of the bureau staff. He performs other related technical and administrative duties.

QUALIFICATIONS: Each applicant must be a graduate engineer and be registered as a professional engineer in the State of Ohio. He must have at least six years of successful experience in the field of air pollution control and in the design, construction, inspection and installation of heating, refrigerating, air-conditioning, ventilating and similar building mechanical equipment. At least half of his experience should have been in a responsible supervisory capacity. He must have a wide knowledge of air pollution causes and contributing factors, and of feasible methods of abatement. He should be thoroughly familiar with all types of industrial and residential fuel-burning equipment, and of practical methods of installation and operation inspection and control. Administrative ability is essential. He should be proficient in securing voluntary compliance with ordinances and regulations. Facility in verbal and written expression is important. He should have, or qualify for, an Ohio driver's license.

Age: 30-55

AIR POLLUTION CONTROL CHEMIST

DUTIES: This employee is in responsible charge of the Air Pollution Measurements Program which includes both laboratory and field testing work. He develops and conducts a wide variety of tests in the general atmosphere and at specific sources, including tests of particular vents and stacks. He uses both simplified methods and highly complex continuous automatic chemical measuring devices for very low concentrations. In conjunction with the inspection force, he inspects and observes potential air pollution sources of a wide variety and consults with plant officials and engineers regarding the abatement of air pollution found in his tests. He prepares reports of his work and assists in the inspection force in obtaining corrective action. He may appear as a witness against violators where air pollution tests are involved. He writes technical papers and reports describing the work being done and accomplishments. He does other related work.

QUALIFICATIONS: Each applicant must be a graduate chemist or engineer, with some experience in air pollution analysis. A chemical testing and research background is helpful. Ability to do original thinking in the development of test procedures and testing devices is essential. He must be able to meet the public, and particularly plant officials. A knowledge of, or interest in, meteorology is helpful. Mechanical aptitude is desirable. He must be able and willing to work in high places such as on roofs and scaffolds. He must have a normal sense of smell and normal vision with glasses and also possess color acuity. He must be willing and able to drive a car and be properly licensed.

AIR POLLUTION TECHNICIAN

DUTIES: This employee performs a variety of laboratory analyses and other tests associated with air pollution evaluation. He takes samples and makes tests using standard chemical laboratory equipment and procedures as well as specialized air pollution automatic measuring instruments, weather instruments, and other devices and methods which may be used to locate the origin of air pollutants, determining the degree of contamination, identifying the source, and developing methods for air pollution prevention. These procedures involve the making of chemical solutions, performing chemical analyses, maintaining instruments, recording data and interpreting the results. He may make field observations of pollution conditions and perform other related work.

QUALIFICATIONS: Each applicant must have at least two years' experience in responsible laboratory work. He must have a good knowledge of basic chemistry and be well trained in methods of quantitative and qualitative analysis. Some mechanical aptitude and ingenuity is desirable in this work. He must have a normal sense of smell and normal vision with glasses and possess color acuity. He must be able and willing to work on roofs and scaffolds as necessary. He must be willing and able to drive a small truck and possess a valid Ohio operator's license. A high school education is necessary. Two years of college with completed courses in chemistry or chemical engineering is desirable and may be substituted for the experience requirement.

SUPERVISOR OF AIR POLLUTION CONTROL INSPECTION

DUTIES: This employee directs the inspection staff in field operations to enforce air pollution ordinances. He supervises the techniques of inspection, schedules work, reviews reports and gives assistance on complex or difficult cases. He makes personal investigations of complaints and violations, prepares cases for the Air Pollution Board or the courts and recommends disposition. He recommends modifications and additions to existing ordinances and procedures. He enforces ordinances related to exhausts, dusts, fumes, visible smoke and fly-ash and regulates the sale and use of solid fuel. He supervises the annual inspection of heating and power plants and controls the installation of fuel-burning equipment. He advises the professional staff of enforcement situations and pollution potential, cooperates with them in tests to discover and control industrial air pollution and directs less complex and recurring tests. He assists in the review and approval of applications for air pollution control equipment. He performs related duties.

QUALIFICATIONS: Each applicant must have a thorough knowledge of air pollution control practices, laws and ordinances. He must be thoroughly familiar with the operation and installation of air pollution control equipment and power and combustion equipment. Supervisory ability and a general knowledge of the policies and procedures of the division are essential. He must have an aptitude for administrative operations and be able to write reports. He must have, or qualify for, an Ohio driver's license.

INTERCOMMUNITY AIR POLLUTION CONTROL OFFICER

DUTIES: This employee is in immediate charge of the Metropolitan Air Pollution Program for communities adjacent to the City of Cincinnati. He meets with officials of non-participating communities to describe, and encourage them to join the program. He makes personal observations of such pollutants as smoke, dust, fumes, noxious gases and odors and issues warnings of violations with recommendations for correction. He answers complaints of violations and determines the magnitude, source, and abatement method of the condition. He makes plant inspections and recommends installations or methods to avert or reduce air pollution. He may review building construction plans for potential air pollution problems. He assists in general and specific air quality measurements. He prepares and presents cases of violation for consideration of the Metropolitan Air Pollution Hearing Board and keeps appropriate records of the Board's activities and findings. He may sign affidavits and testify in court actions on behalf of member communities. He prepares reports of his activities. He performs related duties as assigned.

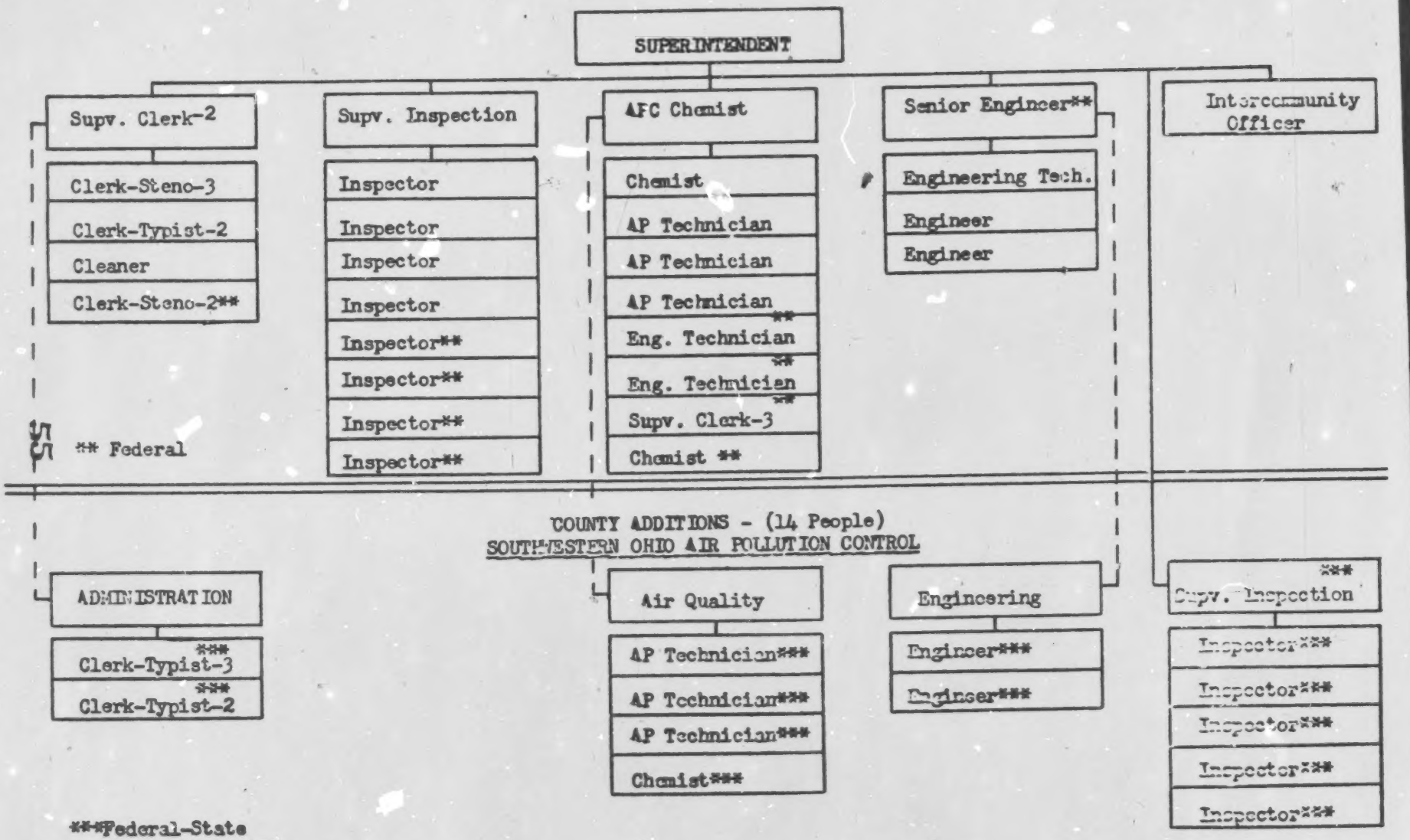
QUALIFICATIONS: Each applicant must have two years in an eligible classification. He must have a thorough knowledge of air pollution control and the laws, ordinances and agreements involved in the Metropolitan Program. He must be skilled in making personal contacts and in performance of staff work involved in providing a contractual service to other communities. Facility in verbal and written expression and ability to maintain and enlist support for the Metropolitan Program are valuable personal traits.

ASSISTANT SUPERVISOR OF AIR POLLUTION CONTROL INSPECTION

DUTIES: This employee is a general assistant to the Supervisor of Air Pollution Control. He assists the supervisor in directing the work of all inspectors. He will be assigned special inspections and enforcement problems from time to time, including preparation and evidence gathering for legal prosecution of violators. He will be required to prepare reports, and assist in the clerical duties of the supervisor. He must have a thorough working knowledge of laws and ordinances of the City and Ohio State Implemtation Plan. He will be the Acting Supervisor on shift and weekend enforcement. He makes inspections and recommendations to comply with Code requirements. He may review building plans for air pollution potential, compiles evidence and assists in air measurements. He may sign warrants and testify against violators. He performs related duties.

QUALIFICATIONS: Each applicant must have two years in an eligible classification. He must have a thorough knowledge of the laws, ordinances and Ohio Air Pollution Control Implementation Plan. He must be thoroughly familiar with the operation and installation of air pollution control process, power and combustion equipment. While both chemical and mechanical processing experience is desirable, proficiency in at least one area is required. Administrative abilities are essential. He must have an aptitude for writing reports. He must have or qualify for an Ohio driver's license.

DIVISION OF AIR POLLUTION CONTROL - CITY OF CINCINNATI



***Federal-State
January 31, 1972

AIR POLLUTION CONTROL EQUIPMENT INSTALLED - 1971

Company	Equipment	Cost
Cincinnati Bandag	tire buffing system	$ 4,000
Cincinnati Post Times Star	fume scrubber	15,000
Cincinnati Post Times Star	electrostatic air cleaner	5,850
Cincinnati Metropolitan Housing		
Lincoln Towers	14 compactors	127,400
Rowe Towers	2 compactors	31,000
Ferguson Hills Drive-In	incinerator	1,800
Frisch's	incinerator	4,500
B. F. Goodrich	tire buffing system	3,000
Gregory's Steak House	electrostatic precipitator	4,400
Hilton Davis	wet scrubber	20,000
Hilton Davis	fume scrubber	10,000
Hilton Davis	fume scrubber	2,500
Ideal Medical Building	incinerator	900
Inmont Corporation	fume incinerators	18,500
E. Kahn's Sons	2 condenser-incinerator towers	29,450
Lunkenheimer Company	cyclone type dust collector	10,370
Lunkenheimer Company	baghouse dust collector	13,155
M & M Metals Company	hot cyclone afterburner	15,000
McDonald's	incinerator	3,500
Mead Corporation	cyclone separators	23,200
H. H. Meyer Packing Company	condenser - incinerator	8,960
Naat Trinity Methodist Church	stoker	850
Nutone	fume exhaust system	2,880
Old Vienna	electrostatic precipitator	1,350
Queen City Grain	dust collector	3,500
River Cement Company	bag house	23,000
Earl Scheib	automotive spray booth	13,000
T. G. Steel, Inc.	dust arrestor	12,000
Tri-State Savings & Loan Company	incinerator burner	350
University of Cinti.(Medical Complex)	incinerator	3,000
	Total	$412,515

INTERCOMMUNITY AIR POLLUTION CONTROL PROGRAM

Company	Equipment	Cost
Procter & Gamble	Electronic Precipitator Tide Process	
	2 mechanical cyclone collectors flyash on standby boilers	$2,000,000
City of Lockland	New Air Curtain Destructor purchased to burn tree trunks and limbs	6,000
Ralston-Purina	New oil burner installed in coal fired boiler	16,000
Reading Power Plant	New boiler and "UOP" flyash collecting equipment installed	25,000
P & G Tide completed 1.3 million	TOTAL	$2,047,000
2 dry collectors 1.0 million	OVERALL TOTAL	$2,459,515

HEATING PLANTS CONVERTED FROM COAL TO GAS AS AN APC MEASURE

City of Cincinnati - 1971

Name	Location	Cost
Apartment Building	2716 Woodburn	$ 7,300
Apartment Building	431 Maple	1,200
Apartment Building	3301 Woodburn	33,000
Apartment Building	3440 Telford	4,800
Apartment Building	Herschel & Erie	2,500
Apartment Building	3387-97 Erie	6,000
Apartment Building	1025 Dana	2,400
Apartment Building	810 Sycamore	1,900
Apartment Building	3705-6 Beatrice	2,750
Apartment Building	1026 Burton	5,100
Apartment Building	725-7 Chalfonte	2,900
Apartment Building	518-30 Hale	17,100
Apartment Building	3493-95 Wilson	4,900
Apartment Building	916-28 Burton	2,000
Apartment Building	542 Prospect	6,200
Apartment Building	2334 Kemper Lane	2,100

CAREER OPPORTUNITIES IN AIR POLLUTION

PROFESSIONALS

ENGINEERS: Chemical, Mechanical, Civil, and Electronics Engineers will make professional engineering analyses of air pollution sources, problems, sensing devices, and permit plans. Air Pollution Control Engineers may find themselves calculating emission inventories, developing emission control and reduction strategies, planning special studies, or leading personnel training programs. Engineers in the air pollution control program must be able to communicate with the public and with industry. In addition engineers may be requested to provide consultation and to assist local areas to plan control programs.

SCIENCE: Chemists, biologists, meteorologists, environmentalists, mathematicians, plant pathologists, and statisticians all can play important roles in air pollution control agencies.

> Air pollution control chemists are largely responsible for chemical analysis of atmospheric contaminants. The chemists' duties, however, do not end at the laboratory door: Air pollution control chemists also provide consultative services to industry and conduct special studies, including air pollution control research.
>
> Air pollution control meteorologists analyze and evaluate the effects of weather on air pollution. Meteorologists use control models to develop the relationships between air pollution problems and air currents. Periodic air quality forecasts and recommendations are input to the pollution control team.
>
> Mathematicians and statisticians construct mathematical models of air systems and measures of cloud particle dispersion to aid the pollution control team. Computers are used to perform calculations with air pollution data and to make air pollution forecasts based on acquired data.

AIR POLLUTION CONTROL SPECIALIST conduct inspections and investigations of reported violations, provide consultative services and make suggestions for improvements or corrective actions. The specialist acts as a professional-level program representative, and may be drawn from any professional discipline.

AIR POLLUTION CONTROL ASSOCIATES like specialists, have diverse academic backgrounds. Associates conduct inspections, investigate complaints and assist the professional staff in reviewing permit plans.

TECHNICIANS

ENGINEERING: Mechanical and Electronics Technicians complement the air pollution control team. Air pollution control associates have an opportunity

to learn about installation, operation and maintenance of air pollution monitoring equipment. Instruments and equipment must not only be maintained and calibrated, but many times modified. Here is where skilled electronics technicians are needed. Air pollution control associates may also participate in testing and evaluation of industrial processes, combustion and incineration units, control equipment, automotive emission control devices and permit plan review. Clearly there is a place for experienced technicians in State and local air pollution control agencies.

SCIENCE: Technicians in biological and mathematical fields are also utilized in air pollution control agencies. Air pollution control associates work in laboratories with chemists and other technicians to analyze field samples and conduct laboratory studies related to air pollution. Associates with automatic data processing experience will be required for operation, maintenance and modification of computers and data from telemetering systems.

QUALIFICATIONS AND TRAINING OPPORTUNITIES

PROFESSIONALS:

Most of the knowledge specifically required of air pollution control personnel is acquired on the job, but a wide variety of agency - and university - sponsored training is available to provide additional specialized knowledge.

The minimum educational requirement for professionals who want to enter the air pollution control field is the bachelor's degree. But as in most technological fields, emphasis on advanced degrees is growing. This is also one field where there is an increasing need for personnel with expertise in two or more related fields.

Much of this specialized knowledge and training is obtained from experience and agency sponsored university training received after starting on the job. In addition, a wide variety of short technological courses for air pollution personnel are offered by the Environmental Protection Agency's Air Programs Office of Manpower Development at several locations. Short technical courses for continuing education are also offered by several other Federal agencies and by non-federal organizations as well.

TECHNICIANS:

Specialists and technicians will come from a variety of educational and experience backgrounds. Most air pollution control associates will be required to have either associate degrees or equivalent experience as technicians in the armed services or in industry. Often, an individual who does not have adequate experience or training can start as an air pollution control aide to acquire skills necessary for promotion. Whether you qualify as an aide or an associate, State and local air pollution control agencies are anxious to offer you on-the-job training and short-term courses at a technical institute in air pollution technology that will make you a more valuable employee.

FOOD CONTAMINATION CONTROL

Exploration Activity #8

OBJECTIVES	ACTIVITIES	RESOURCES
Students will be able to:		
1. Identify careers that are involved with food contamination detection and prevention.	1. Role play an outbreak of gastro-enteritis following commercial boat ride. a. Who detects the outbreak of foodborne disease? b. Who verifies the diagnosis? c. Who verifies that an epidemic exists? d. Who identifies the event constituting common exposure? e. Who delineates the involved? f. Who investigates the source and method of preparation and preservation of suspected foods? g. Who administers action to be taken to reduce possibilities of further occurrence, including educational measures?	
2. List areas of employment.	2. a. Contact Food and Drug Administration b. Contact City Environmental Services c. Search yellow pages for private laboratories.	a. Mrs. Katherine Knarr 684-3501 Central Pkwy. b. Mr. Charles Lenzer City Environmental Services 352-3160 (speaker & possibl field trip for lab tour- Contact Mr. Cooke)
3. Analyze jobs described in 1 and 2.	a. Write job analysis answers.	
4. Investigate some labortory skills used by food sanitarians.	a. Detect the presence of sulfite and/or dyes in ground meats. b. Field trips to Food and Drug laboratories 1141 Central Parkway c. Visit a supermarket (homework assignment) and ask questions such as: 1) How long are eggs, meat and milk kept in store? 2) How long are frozen foods kept? 3) Under what temperature conditions are meat and milk kept?	4a. Lab sheets (Attached I. Detection of sulfites in meat. II. Detection of dyes in meat. b. Food and Drug Consumer Specialist Miss Katherine Knarr 684-3500 c. Question sheet to direct field trip investigations. (Generated by each studeent
5. Evaluate the careers in terms of their number and function.	5a. Write jobs and functions	d. Other areas for possible exploration: 1) food additives 2) health requirements of employees 3) meat inspections 4) pesticide contamination

CAREER DESCRIPTIONS: FOOD CONTAMINATION CONTROL

Health Laboratory Technician

Performs chemical and bacteriological analysis in a public health laboratory, a water treatment plant, or a sewage disposal plant. Works with samples of food, water, air, and other substances.

Sanitary Inspector

Makes unannounced visits to public and private establishments such as restaurants, hotels, cafeterias, and places of public gathering to determine compliance with or violation of public sanitation laws and regulations.

Food Products Inspector

Inspects establishments where foods, drugs, or cosmetics are manufactured, or where milk, meat, or canned goods are processed, to enforce legal standards of sanitation, purity, grading.

Food Service Inspector

Enforces sanitation laws in a particular restaurant, cafeteria, or other public eating places.

Quality Control Technician

Works mostly in laboratory for food processor, dairy, packer, research company or food additive company; checks line operations for proper sanitation, including bacteriological counts; tests ingredients and products; runs certain chemical tests.

Bacteriological Laboratory Technician

Works for dairy, processor or related food product company; makes bacteriological counts and identifications; sterilizes equipment; runs water analysis test, acidity tests, and other necessary chemical and bacteriological test; under direction of supervisor of quality control or bacteriologist.

Agriculture and Markets Dairy Inspector

Works for state; samples and tests milk, cream and other dairy products, inspects dairies to insure sanitary conditions; inspects dairy product manufacturing plants and private laboratories, and makes recommendations for improvement when necessary; occasionally testifies in court about extension, denial, or revocation of licenses.

SUPERINTENDENT OF SPECIAL ENVIRONMENTAL SERVICES

DUTIES: This employee is responsible for management of a wide range of inspectional services including, but not limited to, water quality control (drinking water and swimming pools), solid waste disposal, institutional surveillance (hospitals, nursing homes, day care facilities), occupational health, vector control, animal bite control, mobile home and trailer parks, hotels, motels, and blood banks. He is responsible for the enforcement of local, state and federal sanitary codes. He makes decisions covering the suspension, revocation and reinstatement of licenses and/or permits. He conducts research into health problems, assembles and summarizes data and prepares reports. He reviews subordinates' reports. He may take personal charge of cases involving the citation and prosecution of violators. He writes correspondence, makes public appearances, lectures, attends meetings and represents his division to the community. He performs related work as required.

QUALIFICATIONS: Each applicant must have a bachelor's degree in chemistry or engineering and have three years' experience in the environmental health field of public health as a sanitarian, sanitary engineer, veterinarian, chemist, engineer, or a closely related field, two years of which must have been at a supervisory level; OR have seven years of such experience including two years at a supervisory level. He must be willing to develop and maintain technical competence in the area of environmental health. Management and organizational ability is essential. He must be able to make clear and concise oral and written reports. He must be able and willing to drive a car in the performance of his duties and have or qualify for an Ohio driver's license.

SUPERINTENDENT OF GENERAL ENVIRONMENTAL SERVICES

DUTIES: This official directs the inspection and enforcement program on general environmental sanitation and on all food establishments except those covered by the Bureau of Food Protection. He confers with the owners and operators of groceries, delicatessens, fruit and vegetable markets, egg handling plants, barber shops, rooming houses and other enterprises to explain and obtain compliance with sanitary regulations which apply to their activities. He is responsible for the general sanitary conditions of housing in the city. He plans and reviews the performance of his inspection staff and advises them in unusual or difficult cases. He studies and makes final recommendations for the bureau in cases of revocation of licenses or other prosecution of violators. He is responsible for the maintenance of records, disposition of correspondence and the preparation of reports. He advises on and participates in the development of policy and operating methods on those phases of public health work assigned to his bureau. He is responsible for cooperating with federal, state and local health agencies. He does related work as required.

QUALIFICATIONS: Each applicant must have broad technical background, knowledge and experience in the administration of local, state and federal health regulations. Management and organizational ability is essential. He must be willing and able to maintain technical competence in his field. He must be able to make clear and concise oral and written reports as required. He must be able and willing to drive a car in the performance of his duties as well as have or qualify for an Ohio driver's license.

SANITARIAN

DUTIES: This employee investigates environmental problems and matters of consumer protection and maintains surveillance of food and milk production, processing and distribution. He arranges for the correction or abatement of conditions and practices which are or may result in violation of Board of Health regulations, city ordinances, Ohio Department of Health regulations and the Ohio Revised Code. He is immediately responsible, through his inspections, for the sanitary conditions and operations of eating places, general food establishments, food processing plants, food storage and transportation businesses, dairy farms, milk and ice cream plants, barber and beauty shops, hotels, motels, swimming pools, institutions, and other establishments requiring licenses or permits authorized by the Cincinnati Board of Health or the Ohio Department of Health. He investigates complaints of insanitary conditions in residential property, lodging houses, factories, or other places where violations may occur. He may assist in examining or training food handlers. He may inspect and test weighing and measuring devices such as scales. He attaches official seals to devices found to be accurate or which he has calibrated within tolerance. He orders repair of defective equipment and may impound illegal devices or containers. He verifies labeling and actual net weight of packaged commodities and may condemn those below stated weight. He is directly responsible for the correction of all environmental health and consumer protection violations which may occur within his assigned district through the education of the public, issuance of required orders and, when necessary, prosecution of cases involving non-compliance. He drafts correspondence, prepares reports, and makes sketches. He performs related duties as required.

QUALIFICATIONS: Each applicant must be a high school graduate and have three years of experience in environmental control and consumer protection such as a dairy inspector, a sanitarian in commercial or governmental work, state or federal meat inspector or related work. Additional education may be evaluated to substitute for up to two years of the experience requirement. Mechanical aptitude is essential and a good knowledge of construction materials, plumbing installations and waste disposal methods is desirable. He must be able to meet and communicate effectively with people. He must have the capacity for accurate observation and be able to write clear, concise reports. Neat appearance, clear voice, well rounded vocabulary, integrity and tact are essential. He must be willing to work irregular hours. He must be willing to supplement his training through night school college-level courses in such fields as chemistry, bacteriology and related sciences. He may be required to furnish his own car on a mileage expense reimbursement basis and must have or qualify for an Ohio driver's license.

For information send for pamphlet:
Ohio Association of Sanitarians
and
Ohio Department of Health
450 East Town Street
P.O. Box 118
Columbus, Ohio 43216

RAT PROOFING WORKER

DUTIES: This employee helps to rat-proof buildings and premises of property owners who contract to have such work done by the City. He uses such materials as screen, sheet metal and lumber to restore damaged and deteriorated doors, stairs, steps, window frames, walls and walks, and to eliminate holes, cracks and crevices which permit the entry of rodents. He fumigates rat burrows, distributes various types of rat poison in infested areas, and disposes of dead rats. He helps to inspect premises on which ratproofing orders have been issued and reports the extent and quality of work done. He makes up supplies of rat poisons, keeps workshop, tools and facilities in orderly condition and checks on supplies. He may be assigned to drive a light truck.

QUALIFICATIONS: Each applicant should have at least three years of experience in rat-proofing and extermination work or three years' experience in general building maintenance and repair. He should be handy with tools and building materials and be able to follow sketches, diagrams and simple specifications. He must have or qualify for an Ohio driver's license.

ADDITIVES IN MEAT

(Field Tests used by food sanitari[illegible])

by
C. Lery Heinlein* & Mary L. Schafer**

BACKGROUND

Although our forefathers took much pride in their gardens and livestock and used these for their families, the average American family of the 20th centruy depends on the grocery and meat market for their food supply. The beef we purchase may be from cattle which were slaughtered at a meat packing plant hundreds of miles away. It will have passed through the hands of the owner of the livestock, cattle buyer, the meat packing house, the wholesale dealer and the retail dealer before the housewife purchases it for human consumption.

Since meat is perishable, it is necessary to have some kind of check on the conditions under which the meat has been held while it was being passed through all these hands. Our various governmental departments control these conditions through advisory and enforcement programs. Officials from these agencies are constantly on the lookout for the appearance of spoiled or decomposed meat. Sometimes unscrupulous handlers may add foreign substances to meat products to mask or hide spoilage or decomposition. For this reason the sanitarian or inspector frequently analyzes the food in the field for additives. If the tests indicate that they are present, the establishment which processes the food is subject to disciplinary action.

It is very desirable for the sanitarian or inspector to have simple field tests that he can use to detect these food additives. These tests must be of such a nature that he can perform them without the use of elaborate laboratory equipment. They are usually designed so that there will be a color change in the presence of the additive for which the test is being conducted. However, they may occasionally give a color change with materials other than these additives. For this reason if a sample of meat gives a positive test for one of the undesirable additives the sanitarian or inspector must then send a sample of the material to his laboratory for more elaborate and specific tests.

Statement of the Problem

To detect the presence of sulfite and/or dyes in ground meats. These

*Cincinnati, Ohio, Public Schools
**Chemist in Milk and Food Sanitation, Robert A. Taft Sanitary Engineering Center

are investigations based on procedures recommended by Drs. Ferdinand A. Knorff and Emanuel Kaplan of the Baltimore City Health Department for food sanitarians.

PART I. DETECTION OF SULFITES IN MEAT

BACKGROUND

A test that is frequently used by the food sanitarian on ground meat products gives a positive test if "sulfites" have been added. "Sulfites is a general term used to describe several different closely related sulfur compounds, including SO_2, (sulfur dioxide); H_2SO_3, (sulfurous acid); Na_2SO_3 or K_2SO_3, (the sodium or potassium); and $Na_2S_2O_5$ or $K_2S_2O_5$, (the pyrosulfites or metabisulfites). It is permissible to use these substances as preservatives for dried fruit and as antibrowning agents in cut fruits and vegetables. There is no health hazard connected with their use at low levels. Since they impart a bitter taste if present in too large a concentration, the consumer will reject foods containing excess amounts of these chemicals.

Unscrupulous meat dealers add sulfites to dull colored meat to restore the redness so that the meat becomes "fresh" in appearance. This practice is not permitted by most health agencies since the sulfites mask the decomposition of the meat by inhibiting the growth of the spoilage organisms that usually produce the recognized signs of decomposition. It is for this reason that food inspectors and sanitarians are constantly on the lookout for the addition of sulfites to ground meat.

This experiment describes the field test which sanitarians and inspectors use to detect sulfites. This test is very sensitive and will detect as small an amount of sulfite as one grain in a pound of meat. Also, it is a fairly specific test. Materials such as nitrates, nitrites, sugars, and salts, which are permitted in some types of meat, do not give a positive test.

Materials

Malachite green dye - certified by the Biological Stain Commission; may be obtained from any reliable local chemical supply house.

Balance (accurate to .01 of a gram)
Graduate, 100 ml.
Distilled water
Beaker; 250 ml.
Bottle with dropper assembly
Ground meat samples
Waxed paper squares
Medicine dropper or pipette
Tooth picks or wooden spatula
Sodium sulfite - reagent grade; may be obtained from any reliable local chemical supply house.
Teaspoon measure

PROCEDURE

A. To detect the presence of sulfites in ground meat requires the use of an aqueous solution of malachite green dye. This solution should be prepared in advance by the teacher. To prepare the solution, weigh out 0.02 grams of the malachite green dye (use a balance accurate to 0.01 of a gram). Using a graduate, measure out 100 ml. of distilled water and combine this with the 0.02 grams of dye in a 250 ml. beaker. This dilution will make enough solution for approximately 200 determinations. The excess should be stored in a bottle with a dropper assembly. On storage the dye solution will deteriorate; it should be examined frequently for precipitate and discarded if the solution is not clear.

B. The use of malachite green dye solution in a sensitive test for sulfites in meat can be achieved in a few seconds. Place one-half teaspoon of the ground meat on a piece of waxed paper. To this add one dropperful of 0.5 ml. of the dye solution. Stir the meat and dye with a toothpick for several minutes. In the presence of sulfite, the green dye will become decolorized and the meat will remain very red and fresh looking. The time for decolorization will indicate the amount of sulfite present; as little as one grain of sulfite per pound of meat can be detected. If no sulfite is present, the ground meat containing the dye will remain a dark-green color.

FOLLOW-UP

A. Controlled experiments involving the test for sulfites in meat can be devised by the teacher to challenge pupil discrimination. Several variations are suggested as follows:

1. Prepare a solution of sodium sulfite by combining about 0.2 grams of sodium sulfite in 10 ml. of distilled water. Secure one pound of sulfite-free ground meat. Add 5 ml. of the sulfite solution to one-half pound of this ground meat and mix thoroughly. Allow this meat-sulfite mixture to stand in a cool place (preferably a refrigerator) for two hours before using. To the other one-half pound quantity of ground meat, add 5 ml. of distilled water and allow it to stand in a cool place for two hours. Label each quantity for later identification. Have pupils note any difference in appearance; test a sample of each quantity with malachite green dye and discuss the results.

2. Arrange five separate teaspoons of sulfite-free meat in a sequence, on squares of wax paper. To three additional separate teaspoons of meat, add sodium sulfite solution(from the solution prepared previously) in the following amounts: to one sample add two drops of the sulfite solution, to another add four drops of the sulfite solution, and to the third sample add six drops of sulfite solution. Have pupils use malachite green dye solution to test for the presence of sulfites in meat. Repeat using different arrangements of control samples and varying quantities of sodium sulfite solution.

B. Have pupils bring samples of ground meat to the classroom from home or varied sources. Using malachite green dye, have pupils test these samples for the addition of sodium sulfite. Since positive reaction occasionally results from other materials than additives, every precaution should be taken

to protect the identity of the dealer from the pupils in the class. Any samples showing positive test should be called to the attention of the local or state health officer.

PART II. DETECTION OF DYES IN MEATS

BACKGROUND

When glandular organs and excess fat are combined withround steak in the preparation of ground meat, the resultant product does not have the desirable bright red appearance of freshly ground round steak. In order to increase the sales appeal of the ground meat, the unscrupulous meat dealer adds red dye during the grinding procedure. The dye he uses may be a harmless certified dye which is permitted under federal food legislation for use in foods where contents are indicated on the label. For example, red dyes are added in the preparation of synthetic jellies, used as spreads or fillings in foods. However, it is against the law to use it in ground meat since it masks the ingredients of the ground meat.

A field test used by food inspectors and sanitarians for the detection of the red dye in ground meat is described in this experiment. A positive test will be obtained in the presence of any dye which is soluble in an aqueous alcohol solution.

MATERIALS

One-half teaspoon measure
Ground meat samples
Beaker 50 ml.
Ethyl Alcohol (95%)or methyl alcohol (rubbing alcohol purchased at the drug store may be substituted if the other alcohols are not available)
Stirring rod
Distilled water
Graduates, 10 ml., 100 ml.
Reagent bottle, 125 ml.
Glasswool
Funnel, 65 mm.
Test tubes
Waxed paper squares
Pipette, 1 ml. or 2 ml.

PROCEDURE

A. Place one-half teaspoon of ground meat in a 50 ml. beaker.

B. Add 10 ml. or 80 percent alcohol to the meat in the beaker and mix thoroughly with a stirring rod (to obtain 80% alcohol, dilute 84 ml. of 95% alcohol to 100 ml. by measuring out 84 ml. of alcohol with a 100 ml. graduate and adding distilled water to the 100 ml. mark; mix thoroughly and store in a reagent bottle).

C. Filter the alcohol-meat mixture through a small quantity of glasswool in a 65 mm funnel or a coarse filter paper such as Whatman #4.

D. Collect the filtrate in a test tube and visually observe for the presence of dye. Meat without dye added will have a slight yellow color; since yellow dyes are never added to meat, a reddish tinge will indicate the presence of dye.

FOLLOW-UP

A. As in the preceding demonstration, controlled experiments can again be devised by the teacher to challenge pupil discrimination, for example:

1. Separate one-half pound of ground meat into two equal portions and spread each portion out in a thin layer on a waxed paper square. Mix one drop of red U.S. certified food coloring to 2 ml. of distilled water. Using a pippette, distribute this 2 ml. of water and dye evenly over one thin layer of meat. Add 2 ml of distilled water to the other sample of meat. Label each quantity for identification. Have pupils observe differences in appearances and test each sample for the addition of dye.

2. Using the sequence idea described in the preceeding experiment, arrange samples of meat so that dyed samples are intermixed with dye-free samples. Have pupils test for the presence of dyes in the meat.

B. Test for dye in samples of meat brought from varied sources; precaution should be taken to protect the identity of the dealer. All positive results should be called to the attention of a state orlocal health officer.

APPLICATIONS

These tests are demonstrated in the Training Course on Laboratory Methods for Prevention and Control of Food-Borne Disease which is held at the Sanitary Engineering Center each year. This course is designed specifically for laboratory and supervisory personnel concerned with methods, standards and operational procedures applicable to a food sanitation program.

REFERENCES

Feigl, Fritz. Spot Tests in Inorganic Analysis. 5th Ed., p. 311 Elsevier Publishing Co. (1958).

Korff, F. A. and E. Kaplan. Field Equipment for Food Inspectors. Amer. J. Pub. Health, 32, p. 1110 (1942)

Korff, F. A. and E. Kaplan. Revised Field Equipment for Food Sanitarians. 17, p. 80 (1954).

Lehman, A. J. Sulfites in Food. Assoc. Food and Drug Officials of U. S. Quart. Bull., 21, No. 1, p. 29 (Jan. '57).

Mellan, Ibert. Organic Reagents in Inorganic Analysis. p. 561. The Blakiston Co. (1941).

Official Methos of Analysis of the Association of Official Agricultural Chemists. 8th Ed. Chapter 27 on Preservatives, p. 507. Chapter on Coloring Matters, p. 710 (1955).

Welcher, F. J. Organic Analytical Reagents. p. 515 D. Van Nostrand Co. (1948).

Woodman, A. G. Food Analysis. 4th Ed. Chaper III. Food Colors and Preservatives. p. 64. McGraw-Hill Book Co. (1941).

Exploration Activity #9

RADIATION AND DECONTAMINATION CONTROL

OBJECTIVES	ACTIVITIES	RESOURCES
Students will be able to: 1. Identify careers that are involved with radiation decontamination control. 2. Perform activities to detect radioactivity. 3. Analyze jobs in field. 4. Evaluate jobs in terms of the kinds available at present.	1. Listen to a resource speaker. 2. a. Use a Geiger Counter to detect radioactivity in classroom. b. Experiment: use photographic negative to detect absorption of radioactive salt (10% uranium nitrate solution) by geranium le[illegible] c. Operate monitoring kit in classroom. 3. a. Complete job analysis sheets. b. Discuss the job possibilities in future years. 4. List the jobs and write the places of employment where these jobs can be found.	1. Civil Defense a. Geiger Counters available from chemistry department at Courter. b. 35mm. black and white film, black paper to wrap negative, negative developers c. Civil Defense, Mr. Leroy MacCarone, 821-1092 monitoring kit. d. National Lead Co. Frank Savage 738-1151 pamphlets from Atomic Energy Commission can be obtained through him. e. Field Trip to Nat'l Lead Mr. George C. Smith, Dir. of Personnel & Industrial Relations Div. Atomic Energy Commission P.O. Box 62 Oak Ridge, Tennessee 37830 Booklets (1-3 free): Nuclear Power & the Environment Atomic Power Safety Radioactive Waste The Creative Scientist-his training & his role careers in Atomic Energy

Exploration Activity #10

PARK AND RECREATION LAND MANAGEMENT

OBJECTIVES	ACTIVITIES	RESOURCES
Students will be able to:		
1. Identify careers that are involved with park and recreation land management.	1a. List parks, golf courses, football and baseball fields, large estates, colleges, etc. that students have visited in the Cincinnati area. b. Bring in pictures, photographs and/or slides of these areas. c. Discuss the jobs necessary for the planning and maintainence of these areas.	1. Job descriptions (Attached)
2. Analyze the careers.	2a. Tour the school grounds and list the jobs performed to maintain the school grounds. b. Listen to speaker and question his career qualifications and duties. c. Interview persons engaged in park or recreation land management (homework assignment)	2a. Film "The Ballad of the Trees" 25 minutes M.T.P.S. b. City of Cincinnati Park Board
3. Evaluate jobs in terms of availability in Cincinnati	3. List jobs and prospective employers.	

CAREER DESCRIPTIONS: PARK AND RECREATION LAND MANAGEMENT

Park Technician

Plans programs that make a park inviting and presentable to the public; supervises the building of trails, beach facilities, picnic areas, camp sites, and roads; evaluates the practicality of landscape plants and directs the planting and development of the site.

Park Landscape Technician

Helps with the drawing and production of park and recreational area plans, and checks to see the plans are followed with proper plantings; frequently discusses the need for field program changes with his employer and the maintenance personnel of the facility.

Grounds Maintenance Technician

Responsible for the care, development, and maintenance of a baseball field, a football field, athletic fields, tennis courts, or playground areas of a college or high school, motel landscaping, industrial parks, or private and public estates.

Interior Landscape Technician

Helps plan and execute the planting and maintaining of ornamental plants that beautify the interior malls of shopping centers.

Lawn Maintenance Technician

Contracts for the care of lawns and shrubs of a number of homes and small estates; makes application of fertilizer, insecticides, fungicides, and herbicides; prunes shrubs and trees, and by schedule assures well groomed ground areas.

Research Technician

Under direction, plants, maintains records data on, and harvests plots of plant materials whether for a land-grant college or a private agricultural research organization.

Conservation Aide Technician

Assists the professional conservationist in the field by helping with the surveying of ponds and small lake sites, developing water and wind erosion control plans, determining type of plantings for wildlife feed and cover, and teaching wise use of land to the public.

Golf Course Technician

Determines when greens, tees, and fairways need mowing; sees that areas needing water are irrigated; carries out the fertilizer and pesticide program; and checks to see that all facilities having to do with play are in good condition.

Park Information Technician

Acts as a guide to groups and tours, explains the botanical or geological points of interest of the park, directs the public to points of interest, and plans descriptive literature that makes the park more interesting and inviting.

Turfgrass Technician

Specializes in turfgrass and usually represents a company selling turfgrass supplies; evaluates growing conditions and makes herbicides; during the winter months, acts as a sales representative for his employer.

GARDENER
(City of Cincinnati)
(University of Cincinnati)

DUTIES: This employee assists in growing and caring for trees, shrubs and flowers. He prepares seed beds and plants bulbs, tree seedlings, shrubs and grass. He weeds and thins out flower beds, and does simple pruning operations. He mows grass with hand or power-operated mower. He sprays or dusts chemicals on infected areas, using simple spray equipment. He fertilizes and waters turf, shrubs and flowers. He digs up and stores bulbs and roots, and mulches planting beds. He performs various other duties as needed, such as removing snow from walks, spreading sand and salt, and cleaning up debris. He may assign and oversee the work of helpers.

QUALIFICATIONS: Each applicant must have at least one year's experience in gardening or grounds maintenance work. He must be familiar with common methods of planting and caring for lawns, shrubs and flowers. He must know proper use and care of gardening tools, equipment and supplies.

For UC, add: he must have or qualify for an Ohio's drivers license.

HORTICULTURIST

DUTIES: This employee performs both field and office work in the horticultural operations of the Park Department. He lays out new plantings and recommends changes or replacements in existing plantings. He advises Park Caretaker on horticultural problems. He schedules the work of the tree maintenance crew and prepares digging orders for the park nursery. He oversees the work in progress. He inventories nursery stock and maintains records of its use. He requisitions horticultural supplies and nursery stock. He prepares cost estimates and periodic reports. He may be assigned to supervise the maintenance and operation of the Mt. Airy Arboretum. In this assignment, he assists in planning future arboretum development. He co-ordinates the propagation needs of the arboretum with the park nursery and assists in such work. He prepares reports of activities and submits articles for publication concerning the arboretum and its plant collections. He conducts arboretum tours and gives slide-talks for interested organizations. He performs other related work as required.

QUALIFICATIONS: Each applicant must be a graduate of an accredited college with major in ornamental horticulture, landscape architecture, or municipal forestry. His curriculum should include horticultural work involving plant propagation, nursery management, and arboriculture. He must have good knowledge of plant materials, botany, chemistry, plant physiology, entomology, plant pathology, and related sciences. Supervisory ability is essential. He must be able to drive a car or light truck as required in the performance of these duties and have or be able to acquire a current Ohio operator's license.

EXPLORATION ACTIVITY #11

Individual Student Exploration into Related Careers. Because of the multiplicity of careers in this occupational area, many have been left untouched in this curriculum guide. In this exploration activity, the students can explore a related career of their choice. There are a number of related careers which are the major subject of other curriculum guides.

OBJECTIVES	ACTIVITIES	RESOURCES
The students will be able to: 1. Identify and explore at least one additional career related to their individual interests and this occupational area. 2. Locate and record specific information related to a career of individual interest to them.	All students select and explore a career or job which is related to both. Their individual interest and the occupational area described in this curriculum guide. The students are to use career information reference located in the class room, school library, public library, their homes and community as resources to complete an "Individual Career Exploration Worksheet" which is attached.	Dictionary of Occupational Titles, Volumes I & II. Occupational Outlook Handbook 1972-73 Ed. Encyclopedia of Careers and Vocational Guidance Volumes I & II (Doubleday) Largo or SRA Career Kits Make a class set of the "Individual Career Exploration Worksheet"

EXPLORATION ACTIVITY #12 (2 Days Suggested)

Student Self Evaluation of Career Maturity

This activity is planned to help the students analyze and learn to value their career-related experiences and the level of their career maturity.

Seven areas of growth and development which have been identified for this use are as follows:

1. Individual and Environment (Social Awareness)
2. Economics
3. World of Work
4. Education and Training
5. Employability and Work Adjustment Skills
6. Vocational Decision Making
7. Self (Self-Awareness)

OBJECTIVES	ACTIVITIES	RESOURCES
Students will be able to: - Respond, in a purposeful and business-like manner, to one or more questions which ask the student to analyze their experiences in each of the developmental areas.	All students are asked to seriously consider their career related experiences. A brief class discussion and/or small group discussions may be used to introduce this topic. The students should view the films "What Do We Look Like to Others" and "I Want to Work For Your Company" If these films have been viewed previously they should be reviewed and discussed. Following a review of these films each student is asked to respond to a set of self-analysis questions prepared by the teacher. To help the teacher in preparing these questions a definition of each developmental area and sample questions for each area are attached to this sheet.	The teacher will need to generate class sets of questions. These two films are available from Resource Services on Iowa Street.

III. APPENDIX

A. Field Trips in Career Development

B. Procedure for Exploration Trips

C. Exploration Trip Permission Form

D. Exploration Trip Report

E. Games and Simulations

F. "6 Bits of Information"-A group Work Exercise

G. Resources

FIELD TRIPS IN CAREER DEVELOPMENT

General Student Needs

1. Field trips commonize the background of the students so that there is a basis from which to develop a strong well-rounded instructional program.

2. Because the student is so far removed from his potential career, he needs a broad understanding and exposure to work.

3. Broad off-school-site experiences build readiness for learning by demonstrating that basic skills are essential to a productive work-life.

4. To thoroughly understand a career, the student needs to see the job first hand.

5. Students may not realize all the implications/facets of an occupation in terms of personal interests until they have an exposure to the worker in action.

6. Omission of hands-on experiences may cause a lack of credibility in those courses taught, in the upper levels.

7. While field trips benefit the student, they also benefit the teacher, who, without their assistance, is required to serve as expert on the details of many careers which are not necessarily related to his own speciality.

8. Field trips, when used correctly, can be a source of creating better communication and understanding between business, labor and industry in the community and the school.

Specific Student Needs

Field Trips will do the following:

1. Develop an appreciation/awareness that an individual's skills, talents and senses are used in a variety of ways.

2. Develop an awareness of the importance of responsibility and attitude for one's work.

3. Encourage the development of communication skills. Broad off-school-sites experiences demonstrate need and provide motivation for skill learnings.

4. Develop an awareness of the interdependence of the student and all workers.

5. Develop an awareness that there are many people who have different responsibilities in business, labor and industry.

GUIDELINES FOR IMPLEMENTATION OF FIELD TRIPS IN CAREER DEVELOPMENT

1. The local administrator is responsibile for observance of the guidelines by participating staff members.

2. The local administrator should take responsibility for appointing a person to finalize field trip arrangements.

3. There should be planning of each trip well in advance.

4. Teachers should make field trip plans in consideration of/consultation with other teachers who have a teaching responsibility for the pupils.

5. For the convenience of the faculty, field trip information should be given out several days in advance including destination, length of time out of school, and students participating.

6. The teachers should be aware/appreciative of the expense of the trip to the business or industry in relation to the time spent hosting visitors.

7. Teachers should justify the trip in relation to their instructional program.

8. Teachers who desire to take a particular field trip should plan the trip together, although they may not go together.

9. The faculty of each school may prepare a list of meaningful walking trips utilizing the resources of the local community.

10. After the arrangements have been made, and before the trip, there should be communication between the teacher and the contact person at the place where they are going to clarify teacher expectations.

11. Students should be adequately supervised not only for their safety, but to minimize the interruption to business or industry.

12. There should be well planned pre- and post-activities for each trip.

13. After each trip, there should be a note of appreciation to the business or industry. The teacher may communicate the extent to which expectations were met.

14. A follow-up report concerning the value of the trip and results relating to the specific reason for the trip should be submitted to the administrator/coordinator.

15. Identify the businesses and industries of the Cincinnati community that have only one representative (i.e. the phone company) and those businesses and industries that have multiple representatives in this community (i.e. bakeries, garages).

16. To avoid overloading of limited field trip sites, and to maintain privileges, it is necessary to clear requests for these trips through a central clearing office to be designated by Jack Ford.

17. Teachers may build a list of trips and experiences that parents could provide for their children outside of school hours.

PROCEDURE FOR EXPLORATION TRIPS

SCHEDULE CONSIDERATIONS:

An opportunity is to be provided for students to visit cooperating organizations in small groups for a highly personalized and individualized experience directly related to their career interests. It is essential to minimize the burden on cooperating organizations and to distribute this burden among all community resources and throughout the school year. To accomplish this, trips must be scheduled from the beginning of the school year, and be evenly spaced during the year until every student has been accomodated. The students in a quarter length exploration class may, therefore, participate in an exploration trip prior to, during, or following the time that the course is in progress.

PROCEDURES:

Once each month, or even less frequently, the teacher will need to:

1. Place a single phone call to a cooperating organization to set the date and time for the trip.

2. Notify Mr. Jerome Couzins (Education Center, 230 East Ninth St.) of the date and time for the trip.

3. Select six students from the Career Exploration class list.

4. Send permission slips and trip report forms to the selected students via their homerooms.

Permission slips and report forms are illustrated on the following pages. These forms should be reproduced from this curriculum guide as required.

The career committee chairman or coordinator will provide you with a list of organizations which are known to be willing and able to accommodate your students. Addresses, phone numbers and names of persons to contact will be provided.

CAREER EXPLORATION TRIP PERMISSION FORM

You are schedule for _____ (Career Course Title) which meets 1-2-3-4 quarter. Exploration trips will be scheduled throughout the year regardless of whether the course is in session.

A trip has been schedule for _____ (Date) to _____ (Name of Company) Please have this form signed and return to _____ (Teacher's Name) _____ (Room) before _____ (Date).

My son/daughter _____ has my permission to visit _____ on _____ with the Career Exploration Course _____. The group will return to school upon completion of the tour. There will be about six students in each group.

_____
Parent/Guardian Signature

_____
Date

The following teachers have been informed of my absence from class. (Teachers' signatures required.)

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

EXPLORATION TRIP REPORT

1. Course Title _____

2. Student's Name _____

3. Organization or Company _____

   Address _____

   _____

4. Major Products or Service:

   1. _____ 4. _____

   2. _____ 5. _____

   3. _____ 6. _____

5. Major Types of Jobs:

   1. _____ 4. _____

   2. _____ 5. _____

   3. _____ 6. _____

6. What did you like best about this trip?

   _____

   _____

   _____

7. Did you see any jobs that you would like to do? List them.

   _____

   _____

8. What did you learn from this tour?

   _____

   _____

_____

Signature
Representative of Organization
Visited

APPENDIX E--ENVIRONMENTAL SIMULATIONS AND GAMES

Man In His Environment
Two-Part Kit
from local Cocoa Cola distributor
free

1st-Make Your Own World--Whole class, grades 3-12--a simulation where children represent farmers, jobless workers, real estate developers, air, forest, deer, etc. Discuss then vote on proposals, like an industrial park or new highway; the interrelated effect of these actions is then seen on farmers, deer, etc. (Excellent-Easy)

2nd-Rescue in Space --Whole class, grades 3-12--a simulation where children divide into two groups, astronauts in two spaceships, plus groundcontrollers responsible for air, water, food, and living space; after one spacecraft breaks down on Mars, challenge back to Earth in the closed ecological system of a single spaceship (our Earth itself is a closed ecological system) (Very Good)

The Redwood Controversy--Grades 5-12, 12-30 students as senators and witnesses debate proposals for a Redwood National park; ecological and financial factors involved in conservation efforts are brought out along with participation politics.
Houghton-Mifflin
$7.50

Ecopolis --Small group or whole class, grades 5-9--
Interact First, players trace history through animals,
Box 262 Indians, and settlers trying to survive;
Lakeside, California Second, survivors discuss and decide on future
92040 of country park and population control.
$10.00

Balance --Whole class, senior high much like Ecopolis,
Interact only more advanced.
$10.00

Foxes and Rabbit --Small group, grades 3-8--players toss box
from Ecol. Kit 3 (weighted square) on rabbits (small squares)
Predator-Prey ($6.00) to simulate interdependent changes in popula-
Urban Systems tion size of a predator and a prey-(Easy)

The Pollution Game
Houghton-Mifflin
110 Tremont Street
Boston, Mass. 02107
$9.00
--2-5 people, grades 2-12--students become businessmen who have to use their bargaining skills to keep air and water pollution levels below lethal limits without going broke; profit motive conflicts with other human values as students try to agree on proposals to improve environmental quality. (Very good-Easy)

"Dirty Water"
Urban Systems
1033 Massachusetts Ave
Cambridge, Mass.
02138
$10.00
(also available locally)
--3-5 people, grades 2-12--water pollution game where students meet the problems of industrial wastes, nuclear power plants, and upstream pollution in "Fight For Clean Water." (Good-Easy)

"Smog"
Urban Systems
$10.00
(also available locally
--3-5 people, grades 4-12--possible lower -air pollution game that lets player fight business interests, public indifference, and federal finding policies to bring back clean air.

"Ecology"
Urban Systems
$10.00
--3-5 people, grades 4-12--game of man and nature to build a better world by leading a population safely through the conflict between man's inventive genius and his environment.

"Population"
Urban Systems
$10.00
--3-5 people, grades 6-12--game of man and society that lets students face and solve the crisis of overpopulation in a rapidly developing country.

The Planet Management Game
Houghton-Mifflin
$12.00
--2-5 people, grades 5-12--put players in control of an imaginary planet with a population explosion and a pollution problem; cardboard computer helps decision making.

Extinction
Sinauer, Assoc.
Stanford, Conn.
$10.00
--Small group-each player represents a species trying to not become extinct.

Eco-Cycles
from No Time to
Wast Kit ($7.50)
Continental Can Corp
633 Third Ave.
NY, NY 10017
--Small group, grades 3-5--running style card game involving the building of chains of decomposer, resource, plant, herbivore and carnivore cards (also pollution cards).

Pollution Solutions
from Recycling
Resources ($12.50)
Continental Can Corp
--7-28, Grades 7-9--players are mayors and company executives (Ratio 1:7) compete to make most money and not pollute (and get sick); player can change game rules by voting.

APPENDIX F

A LESSON PLAN FOR A PROCESS AND PROBLEM SOLVING APPROACH TO LEARNING

In this session we are concerned with techniques and processes of involving people in problem solving activities. The success of these activities will be measured by the application of group interaction and problem-solving skill to the environmental investigation that we do later.

We are concerned, then, about how to transfer the process of involving people in environmental investigations.

I. SOLVING A PROBLEM THROUGH GROUP INTERACTION

Questions and Discussion

1. Have audience arrange themselves in groups of six or have chairs grouped that way ahead of time.
2. Pass out the "6 bits of information" problem, one bit of information to each person (use problem on page 9.)
3. Tell audience that there is a problem to solve, they can tell their group what is on their paper but then must not show it to others.
4. As the problem solving session progresses:
   a. 5-8 minutes into problem write on the board-Trust
   b. 8-12 minutes into problem write-Visual Display
   c. 12-15 minutes into problem write-Matrix

Task A Identify and solve the problem in the "6 bits" activity

Questions and Discussion (After all groups have finished)

1. What kept you from solving the problem to begin with?
2. What helped you to solve the problem later?
3. What were some characteristics of this problem-solving exercise? (List comments from group and discuss.)

INVESTIGATING YOUR ENVIRONMENT SERIES
U.S. Forest Service
Portland, Oregon

6 BITS OF INFORMATION PROBLEM

by Dr. Michael Ciammatteo

B_2 1

Although you may tell your group what is on this slip, you may not pass it around for others to read.

Information:

The Dinosaurs had Tom for a teacher during the third period.

Dick and Belinda did not get along well and so they did not work together.

During the first period the Team Leader taught the group that Harry liked best.

B_2 2

Although you may tell your group what is on this slip, you may not pass it around for others to read.

Information:

All teachers taught at the same time and exchanged groups at the end of the period.

Each teacher liked a different group best. During the second period each teacher taught the group he liked best.

Each teacher taught every group during one of the first four periods of the day.

B_2 3

Although you may tell your group what is on this slip, you may not pass it around for others to read.

Information:

The Freznel Elementary School Intermediate Unit had two teacher's aides, four teachers, and four instructional groups of students.

Each instructional group had chosen its own name.

Sybil was the Team Leader for the Intermediate Unit.

B_2 4

Although you may tell your group what is on this slip, you may not pass it around for others to read.

Information:

Your group members have all the information needed to find the answer to the following question. Only one answer is correct. You can prove it.

IN WHAT SEQUENCE DID THE APES HAVE THE VARIOUS TEACHERS DURING THE FIRST FOUR PERIODS?

Some of the information your group has is irrelevant and will not help solve the problem.

B_2 5

Although you may tell your group what is on this slip, you may not pass it around for others to read.

Information:

Belinda and Ralph disagreed about how it would be best to handle the Bombers who always had trouble settling down to work.

Dick preferred to work with the Champs over all other groups.

Although the Team Leader had been at Freznel School for five years, this was a shorter priod of time than for the other team members.

B_2 6

Although you may tell your group what is on this slip, you may not pass it around for others to read.

Information:

The Team Leader taught the Dinosaurs the second period.

Harry worked with the Bombers in the third period.

Sybil had been at Freznel School a shorter period of time than any of the other teachers in the Intermediate Unit.

4. The people who developed the problem-solving exercise feel that it contains elements of involvement that most all groups go through; it also illustrates the way groups work together on common problems.

   They hypothesized that the following things would take place during the problem-solving exercise: (Write each item on the board, or have a chart made up with each item listed.)

   a. TRUST (will develop). Must trust that the instructor gave you a solvable problem. Must trust each other.

   b. RITUALISTIC LISTENING (will take place).
   This is a kind of polite listening--really without caring too much, because the data offered has no relevance at that time.

   c. REAL LISTENING (will take place.)
   When statements become more meaningful. (Data means something)
   When people interrupt and say, "Say that again!"

      QUESTION: When in your group did you change from ritualistic listening to real listening?

      When real listening occurs, two things will change:
      VISION-Participants will begin to vision the listening by.. really looking at other people..constructing a Visual Display (writing data in a common plact)
      helps make inferences
      don't have to listen to everything
      SPACE-Space factors will change
      people will usually move closer together
      people will sometimes change places, or move around the table.

5. Using this type of activity at the beginning of a session is important for these reasons.

   a. The problem could not be solved without the contributions of each person in the group.
   b. People feel more committed to a session if they contribute by saying something-the earl[illegible] the better.
   c. It's easier to talk [illegible] each other in a small group than to talk to one instructor in front of a large group.
   d. This exercise illustrates that each person in a group brings information and skills that can be used by the entire group to solve common problems. THE PIECES OF PAPER REPRESENTED THE INFORMATION AND SKILLS THAT EACH OF YOU BROUGHT TO THE GROUP.

6. We will be concerned in this workshop with providing ways for each person to contribute knowledge, information and skills to the solving of common problems. The content and activity itself are not always most important-what is important is the idea that you can use different techniques to get people talking to each other and contributing as a group.

7. NONE OF US IS AS SMART AS ALL OF US. (My printing this on the board during the problem solving exercise).

APPENDIX G

FREE LOAN 16mm SOUND FILMS FROM MODERN TALKING PICTURE SERVICE
9 Garfield Place (45202)
421-2516

NOISE POLLUTION — Learning Packet #1

3866 "To Conserve and Protect" 14 1/2 min.

As narrator James Mason says: "Noise pollution, if allowed to go unchecked will rob millions of us of our God-given gift - the ability to hear." This important film covers the different aspects of noise pollution - its causes, bad effect on human beings, and what can and must be done to conserve and protect our precious ability to hear.

WATER POLLUTION — Learning Packet #2

3830 "Water" 27 min.

This film explores both the esthetic and practical use of water. It encourages its wiser use and reuse. It covers hydrologic cycle, water chemistry, pollution, irrigation, conservation, industrial and domestic use.

SOLID WASTE CONTROL — Learning Packet #3

4141 "The Second Side" 14 1/2 min.

This film presents genuine and objective approaches to combating problems of improved waste disposal. Increasing public needs for packaged products can be met without endangering our ecological balance - this film shows how.

3840 "Threshold of Tomorrow" 21 min.

The many and varied responsibilities of a major U. S. industry are explored in this film. Efforts to satisfy the consumer, to protect and replenish natural resources, as well as to make industrial waste productive to the benefit of all, are among challenges explored.

3838 "The Trouble with Trash" 28 min.

Documentary on spiraling waste disposal problem. Shown are laboratories experimenting with self-destruct containers, balers for volume reduction, shredders for recycling waste as soil conditioners, incinerators with scrubbers to reduce air pollution. Also modern sanitary landfill techniques.

4397 "The San Diego Experience" 17 min.

Shows the overwhelming response of San Diego's residents to Alco's, "Yes We Can" aluminum can reclamation and recycling program currently generating almost 2 million reclaimed aluminum cans monthly. Featured are candid interviews with participants.

16mm SOUND FILMS (Cont'd)

AIR POLLUTION — Learning Packet #4

4456 "Something in the Air" 28 min.

The experts speak out on air pollution. Scientists and manufacturing spokesmen explain types of pollutants; what causes them and what is being done about them. Strong emphasis is on pollutants caused by internal combustion.

3085 "The Answer is Clear" 14 min.

Air pollution is the subject of this film. As seen through the eyes of a bus driver; the film discusses the aspects of air pollution and progress made in reducing diesel exhaust smoke and odor.

LAND MANAGEMENT CONTROL — Learning Packet $7

4241 "The Ballad of the Trees" 25 min.

A dramatic film designed to create an understanding and appreciation of American forests with emphasis on the products, recreational and aesthetic values they provide.